

# western industry



JANUARY 1960



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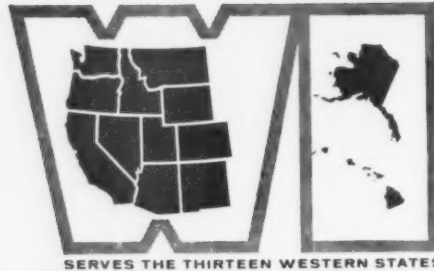
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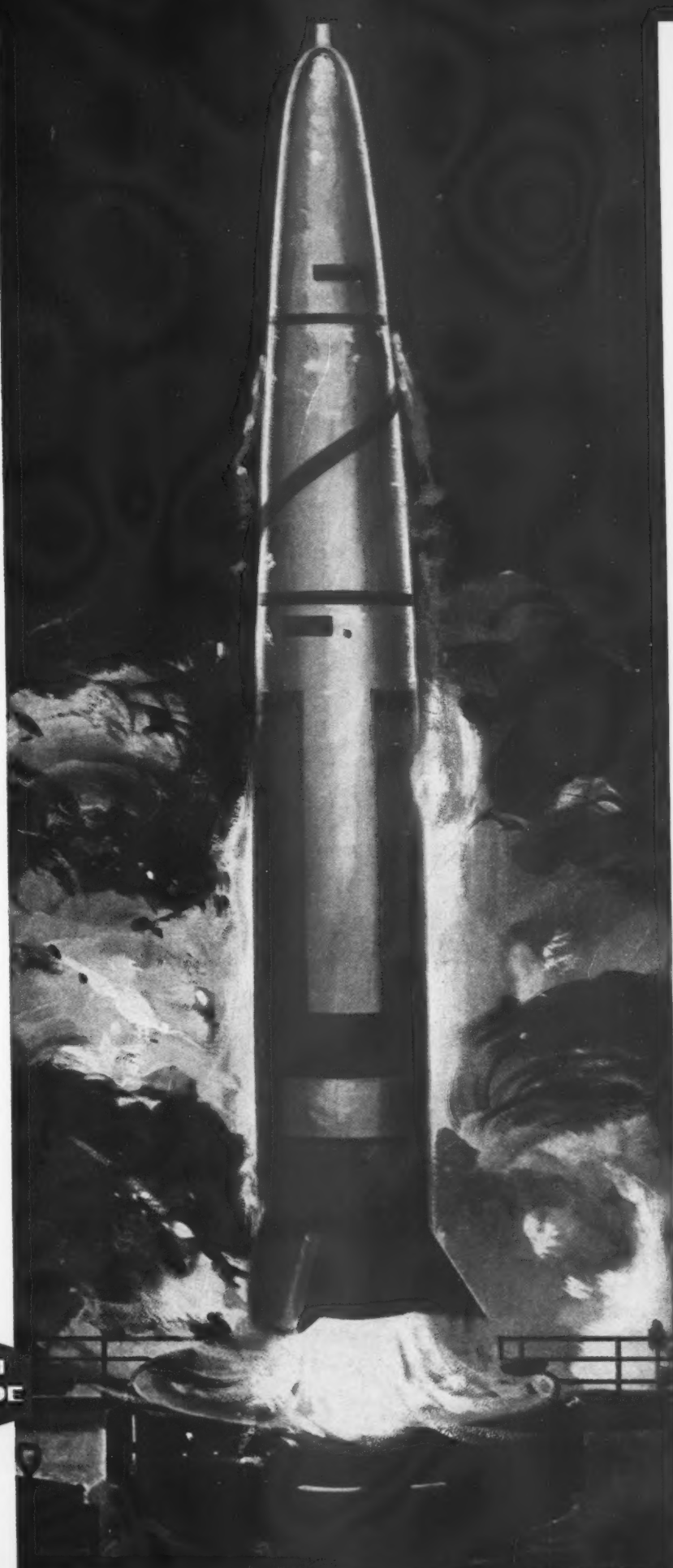
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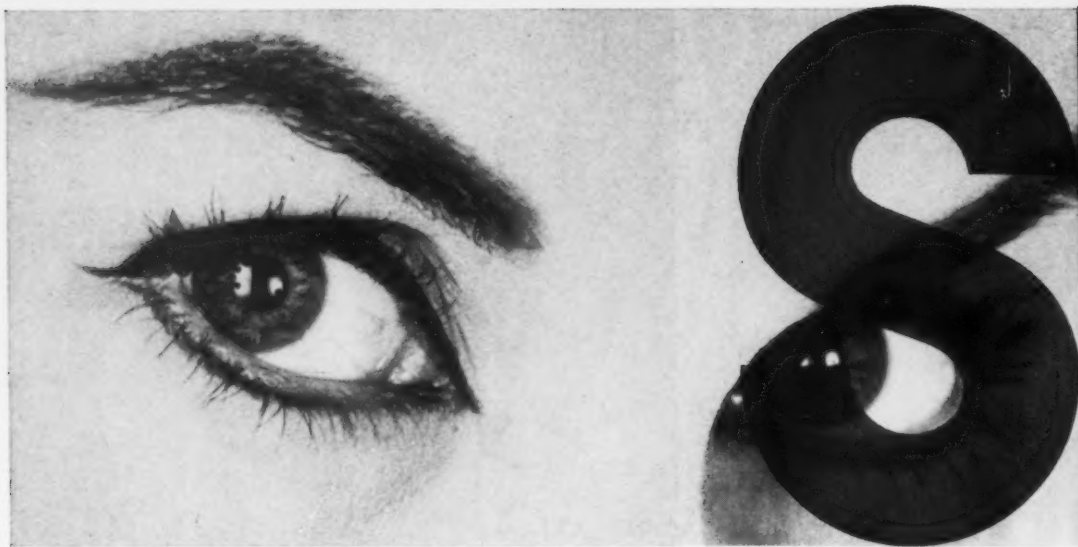
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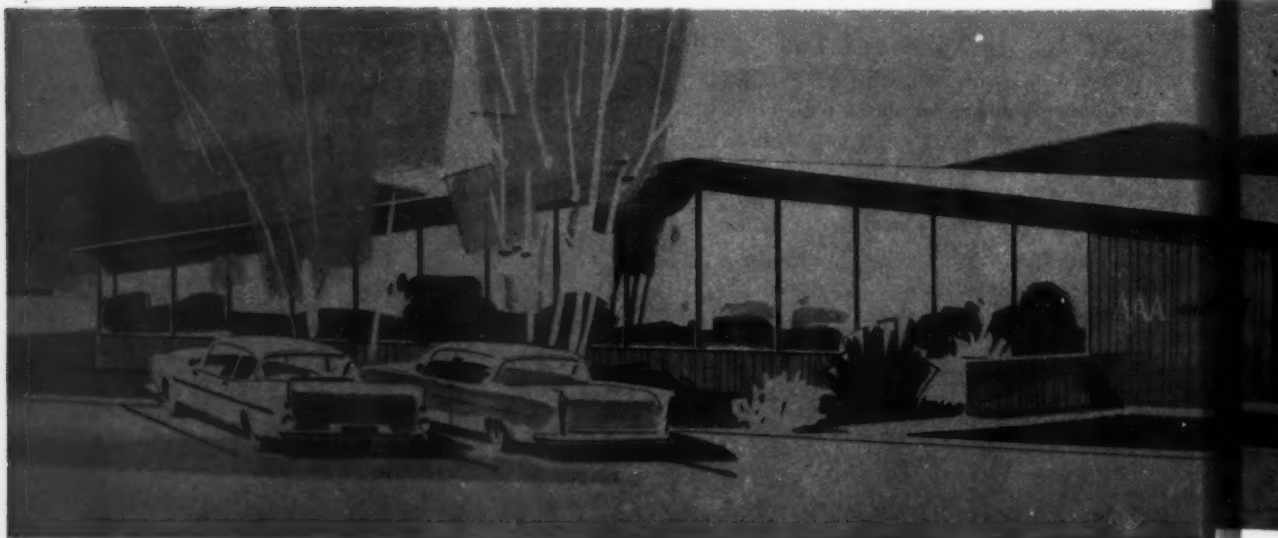
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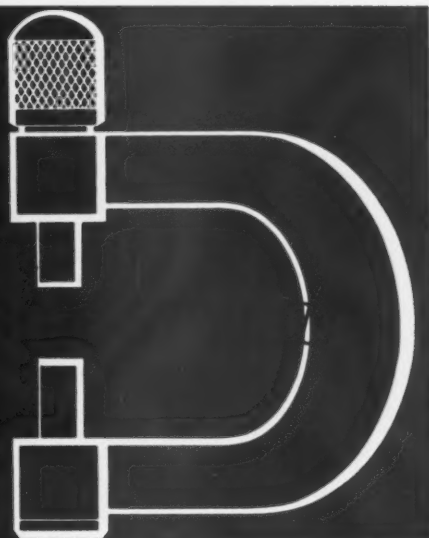




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# western meetings

## American Welding Society Will Hold Annual Meeting in Los Angeles Next April

LOS ANGELES is to be the location of the American Welding Society's 41st Annual Convention and Welding Exposition. It will take place April 25-29, 1960. Technical meetings will be held in the Biltmore Hotel and the welding show at the Great Western Exhibit Center on April 26-28.

The Society has announced that 85% of the available space has already been sold for its Welding Exposition. According to Fred L. Plummer, national secretary, in 1959 some 35,000 square feet were needed to house exhibits and in 1960 a greater demand was anticipated and 42,000 square feet reserved. He stated that the demand for space has been so great it now looks as though 50,000 square feet will be needed.

At the technical meetings held concurrently at the Biltmore Hotel, the Society will sponsor 19 technical sessions consisting of 57 papers, and The American Society of Mechanical Engineers will sponsor four sessions consisting of 12 papers.

## Fork Truck Rodeo on February 6

AS A PRELIMINARY to the forthcoming First Northern California Fork Truck Rodeo, to be held at Oakland Naval Supply Center on Saturday, February 6, members of Material Handling Equipment Dealers are busy supplying instruction programs for users. Dealers report that employers find in-plant elimination contests are instilling better utilization practices as well as driving skills in the fork truck operators.

Closing date for entries will be January 15. Additional information and enrollment forms may be had from Chairman, Fork Truck Rodeo Committee, Naval Supply Center, Oakland 14, California.

## 1960 Electrical Industry Show March 23

THE 1960 ELECTRICAL INDUSTRY SHOW, sponsored by the Electrical Maintenance Engineers Association of California, will open March 23 at Shrine Exposition Hall, Los Angeles, and continue for four days and nights. A record group of exhibitors are scheduled for participation. Allocation of space is 30% greater than in 1958. A number of technical sessions are also scheduled during the Show.

This Show is a biennial event which encompasses the entire electrical field. A new dimension will be added in 1960 with the presentation of a complete Lighting Expo-

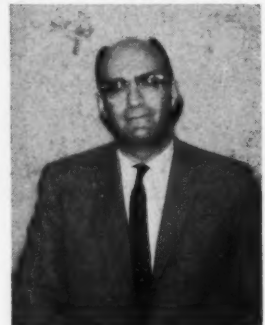
sition, with some 150 exhibits showing the latest advances in lighting.

Urban Beh, Consulting Lighting Engineer and General Chairman of the Lighting Exposition, reports that arrangements for the specialized technical sessions are practically complete. Outstanding authorities in the various fields of lighting will present papers and lead discussions.

## Westerner is New National President of the Society of Packaging & Handling Engineers

NATIONAL president of the Society of Packaging & Handling Engineers is Charles L. Lippman, Assistant Director of Production Planning, Columbia Geneva Steel Div., U. S. Steel. Lippman is the first Westerner ever to have been elected as president of the 20 chapter national engineering society.

The new president said "Our organization is basically solid and I look forward to important advances in SPHE in the coming year. The election of a Westerner to this position indicates a growing awareness in the rest



of the country of the increasing importance of packaging and handling in the West. Lippman is affiliated with the San Francisco SPHE Golden Gate Chapter.

## Purchasing Agents Select Facilities for May Annual Convention

GENERAL SESSIONS for the International National Association of Purchasing Agents Convention will be held in the Los Angeles Philharmonic Auditorium on May 23. The Auditorium, which holds 2,600 and is air conditioned, is considered one of the finest facilities of its kind in Southern California.

Also selected for the annual banquet is the new Biltmore Bowl in the Los Angeles Biltmore Hotel. This facility seats 1,500 persons and has recently been completely redesigned. At the banquet the 1960 Shipman Award will be presented. This gold medal award is not limited to a member of the Association but is given to a person who has performed distinguished service for the cause and advancement of purchasing.

## New Scrap Iron Institute Officers

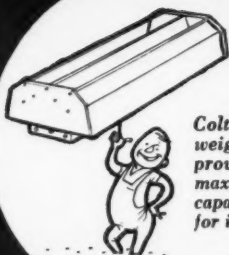
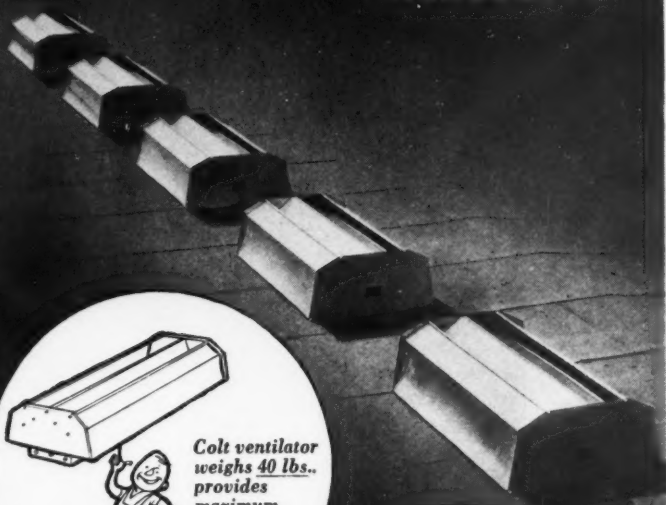
NEW PRESIDENT of the Southern California chapter of the Institute of Scrap Iron & Steel, Inc., is Milton M. Blake of Alpert & Alpert Iron & Metal, Inc. He succeeds Mitchell Lipsett of Steel Products, Inc.

Mack Cottler, California By-Products Corporation, has been elected first vice president; Seymour L. Meyer, National Metal & Steel Corporation, second vice president; Frank J. Pickett, Purdy Company, treasurer.



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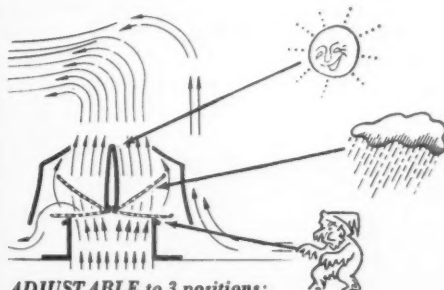
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## Engineering and Management Course

ENGINEERS AND MANAGERS from California, the Western states and foreign countries will broaden their professional skills in a 10 day program to be held Jan. 25 to Feb. 4 at the University of California, Los Angeles.

The 1960 Engineering and Management course will stress the principles and techniques of a systematic approach to management, and the quantitative methods which supply the facts for this approach.

Among the 22 subjects offered top and middle management from large and small companies will be new classes in Reliability for Modern Industry, Integrated Management Control, and Accounting for Engineers and Managers.

Information on registration and living accommodations may be obtained from Reno R. Cole, College of Engineering, University of California, Los Angeles 24.

## Regional Trade Show Program Sponsored by Material Handling Institute

A REGIONAL TRADE SHOW program that extends into 1961 has been announced by The Material Handling Institute. The prime reason for the regional activity is to take the products to the markets rather than the markets coming to the products. The Institute will own, sponsor and produce at least four regional shows. One of these is in the West. February 22-24, 1961, is the time set for The Material Handling Institute's Pacific Coast Show, which will be held in the Cow Palace in San Francisco.

The regional trade show concept was made known by Robert F. Moody, chairman of the MHI expositions committee and sales manager of the domestic industrial truck division of Hyster Co., Portland, Oregon.

## 2nd Metallurgical Roundtable

THE SECOND in a series of semi-conductor metallurgy roundtables sponsored by the Electronics Sub-Committee of the Los Angeles Chapter, American Society for Metals, was held December 2 at Ethyl Auditorium. Discussion centered around thin metal films and magnetic materials, and stressed how new and existing metallurgical techniques can be applied to serve the needs of the rapidly growing electronics industry.

The Roundtable was moderated by John T. Milek, Hughes Aircraft Co. Participants were John Q. Adams, J. Q. Adams & Associates; Chester E. Beintena, Hughes Aircraft Co.; David W. Moore, Servo-Mechanisms Inc.; Earl Olson, Hallex Inc.; Dr. John E. Richardson, Hughes Aircraft Co.

## Westerner Wins Machine Design Award

A NEW AWARD, given by The American Society of Mechanical Engineers for outstanding achievement in machine design, has been won by a Westerner, Charles E. Crede, associate professor of mechanical engineering at California Institute of Technology. He is the first to receive the new Machine Design Award.

Professor Crede, who received his award at the Annual Meeting of ASME in Atlantic City on November 29, is cited as "an inspired leader in the field of shock and vibra-

tion, who through eminent achievement by creative contributions in the research, development and application of shock mounts, has advanced the field of machine design and furthered interest in shock and vibration control."

## Welding Society Has Xmas Party

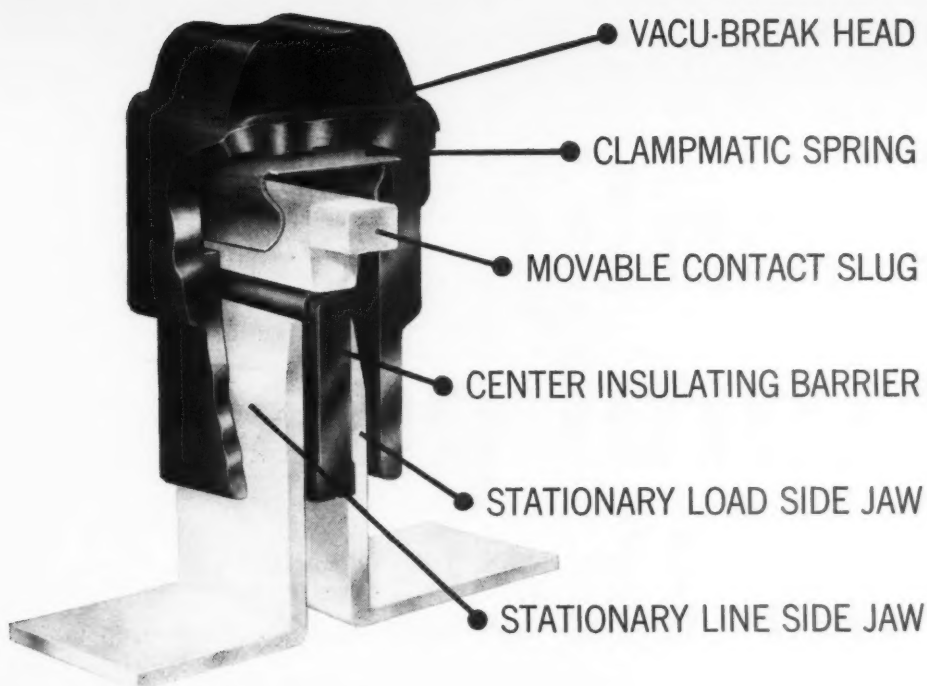
THE AMERICAN WELDING SOCIETY, Los Angeles Section, held its annual Xmas party on December 4 at the Roger Young Auditorium. Some 186 members and guests attended and watched a talented group of performers put on an excellent floor show.



**TOP**—Officers of AWS Los Angeles Section enjoy songs by Mike Kensrue during dinner hour. Left to right are: Chas. Concannon, Director; Al Fenalson, Membership; Sam Hickman, Technical Societies Council Delegate; Leo West, Publicity Chairman; Dick Hayes, AWS Chairman; Orville Eichman, Treasurer and Ways & Means; Al Collins, Student Affairs and Codes; John Ross, Junior AWS Past Chairman; "Chuck" Zwissler, Welding Engineer, Kaiser Steel.

**MIDDLE**—Show with lovely Miss Ann Mills are Dick Hayes of Aerojet Downey, AWS L. A. Section Chairman, and Leo West, Douglas Aircraft, Long Beach Div., Publicity Chairman, AWS L. A. Section.

**BOTTOM**—Prominent in the welding field and enjoying the festivities are, left to right: Roland McGhee, Dept. of Power & Water; Gary Stukkie, Medford Chemical Co.; Joe Cye and Cliff Carney, Welding Engineers, Douglas Aircraft Co., Inc., Long Beach Div.; Roy Parrot, Kaiser Steel; H. Denhart, Kaiser Steel; Clark Johnson, Farwest Welding Equip. Co.; Karl King, Farwest Welding Equip. Co.



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WESTERN INDUSTRY/JANUARY 1960



## WESTERN INDUSTRY forecast for 1960

Western outlook is favorable. A strong economy is assured by the West's rapid population growth, broadening industrial base and the emergence of a new engineering-scientific intelligentsia.

By Arthur C. Prendergast  
Consulting Editor

**A**S THE WEST ends a decade, more signs than ever point to its continued rapid population growth, broadening industrial base, agricultural economy not tied to price supports and the emergence of an engineering-scientific intelligentsia exerting a profound influence on its future.

The West's non-agricultural employment reached an all-time high of 7,885,400 last September. Its manufacturing employment August peak of 1,984,200 was even with, if not above, the record height in 1957. Prospects for 1960 are excellent, subject, of course, to setbacks caused by strikes.

Some noteworthy long-range trends appearing. Census figures reveal the West as the fastest growing area of the country, percentage-wise: 28.7% from 1950 to 1958, as against 14.7% for the North Central (Great Lakes) census region, 13% for the South and only 9.5% for the Northeast.

the South's 6,042,000. Northeast trails with only 3,748,000 additional population.

What determines the future in the long run is the attraction power of each portion of the country. Net civilian migration figures of the Census Bureau show that in eight years 2,576,000 new people came to the West. Only 896,000 were attracted to the North Central region, while the Northeast had only 37,000, and the South lost 1,126,000 by migration. Evidently the West has more to offer in opportunity and living conditions than other parts of the country.

Within the West, California's projected growth of over five million people in 1960-1970 is far more than all the rest of the region. Arizona will have the second largest increase, 595,700. The table indicates that Arizona and New Mexico combined will gain more people than Oregon and Washington, 891,300 as against 783,700. Apparently the warmer climate appeal is a stronger growth factor today than an economy still based to a major extent on forest products.

The West's development of a manufacturing economy, contrasted with the trend of the rest of the country, is illustrated in two accompanying charts and tables. They show: (1) that Western manufacturing employment has climbed in the postwar period while it has declined elsewhere, (2) that Western employment in goods-producing industries in the West in relation to service-type industries is increasing, whereas the reverse is true in the rest of the country.

Western manufacturing employment, according to studies by the Western Regional Office of the Bureau of Labor Statistics, rose almost 48% between 1947 and 1958, but declined almost 3% elsewhere. The relative importance of manufacturing employment increased from 22% of total non-farm employment in 1947 to 24% in 1958. In the rest of the country it fell from 37% to 32%.

In 1947 for every worker in the West in a goods-producing industry there were 2.2 workers in a service type industry. In 1958 this ratio dropped to 2.1. In

### WESTERN POPULATION TRENDS

Estimates by National Association of Manufacturers, Western Division and Stanford Research Institute

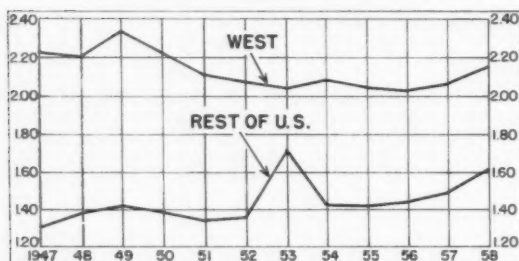
	1950 Census	Estimated 1960	Estimated 1970	Increase 1960-1970
Calif. ....	10,586,223	15,629,000	20,696,000	5,067,000
Ore. ....	1,521,341	1,829,300	2,153,000	323,700
Wash. ....	2,378,963	2,882,200	3,342,200	460,000
Ariz. ....	749,587	1,261,300	1,857,000	595,700
Colo. ....	1,325,089	1,812,300	2,139,900	327,600
Idaho ....	588,637	702,400	779,300	76,900
Mont. ....	591,024	728,000	802,300	74,300
Nev. ....	160,083	309,300	477,100	167,800
N. Mex. ....	681,187	948,800	1,244,400	295,600
Utah ....	688,862	905,000	1,125,200	220,200
Wyo. ....	290,529	332,000	379,000	47,000
Total				
West .....	19,561,525	27,339,600	34,995,400	7,655,800

Numerically, the population bases of the Midwest and the South are greater than the West, and natural increase swells their growth totals slightly faster. Nevertheless the West's gain of 5,487,000 in eight years crowds closely on North Central's 6,508,000 and

the rest of the United States this ratio rose from 1.3 in 1947 to 1.6 in 1958. During this time, employment in Western goods-producing industries increased 42%, in the rest of the country only 4%.

In industrial relations, management is becoming more conscious of cost pressures and the necessity of

**WEST SHIFTS TOWARD MANUFACTURING,  
REST OF U. S. TRENDS AWAY FROM IT**



Ratio of Number of Workers Employed in Service Type Occupations to Goods Producing Industries 1947-1958

Western Regional Office  
(From Bureau of Labor Statistics)

Year	Western States	Rest of U. S.	Year	Western States	Rest of U. S.
1947	2.25	1.30	1953	2.03	1.72
1948	2.20	1.38	1954	2.08	1.43
1949	2.34	1.42	1955	2.04	1.42
1950	2.22	1.38	1956	2.02	1.44
1951	2.10	1.34	1957	2.06	1.49
1952	2.07	1.36	1958	2.15	1.62

remaining competitive. This is already manifest in the length of the steel strike. The economic upsurge forecast for the end of 1959 has been delayed by the recent steel strike, and if a railroad strike ensues it may be postponed still further. The railroads are facing strong competition from other forms of transportation and apparently will be as firm as the steel companies. As other employers come to grips with competitive conditions, more strikes and longer ones are likely to occur in 1960. Though wage settlements probably will be as high as in the past, due to a possible 2½% cost of living increase, close observers feel the unions will be under pressure to give more in return. Adjustments in working rules, staffing patterns and manning schedules may result.

### Construction

Fewer residential starts are expected in the West this year. Some sources look for a decline of 18% to 20% in California with a more moderate decline in Oregon and Washington. Other sources believe that tight money will not be as influential as feared. When the figures are in for 1959 they will show a rise of 12½% above 1958, or 700,000 reported permits in the West, compared with 625,731 the year before, estimates Western Building. Of these totals, residential units accounted for 237,011 permits in 1959, 202,718 in 1958. F. W. Dodge Corporation statistics show \$3,694,743,000 spent in residential construction for the first 10 months of 1959 compared with \$3,519,918 for the comparable period of 1958.

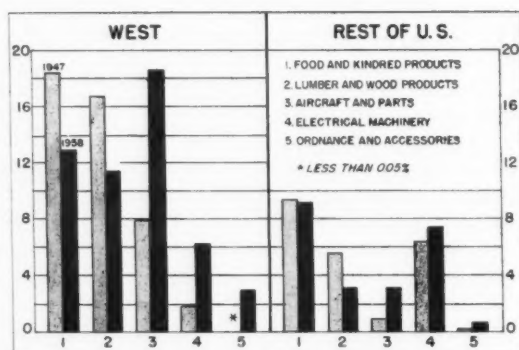
### Steel

The outlook for steel consumption in the West in 1960 is bright. Pipelines, large industrial construction projects, highway programs and other phases of the West's growth economy all want steel. A year ago it seemed as though the West was in for a period of overcapacity. The completion of the big Kaiser expansion at Fontana, U. S. Steel's program at Pittsburg and the enlargement of Bethlehem facilities at Seattle have all failed to produce any over capacity except for certain items. The West is still far from being self-sufficient, and intercoastal and foreign imports are required to meet the remainder of the West's demands.

### Aluminum

Pacific Northwest aluminum output in 1959, estimated by Bonneville Power Administration at 525,000 tons, is up from 471,000 tons in 1958, but substantially below 1958's total of 580,000 tons and 1957's

**CHANGING SHAPE OF THE WEST'S ECONOMY**



Percentage Distribution of Manufacturing Employment in Selected Industries as Compared to Total Manufacturing Employment Western Regional Office (From Bureau of Labor Statistics)

	West 1947 %	West 1958 %	Rest of U.S. 1947 %	Rest of U.S. 1958 %
Food and kindred products	18.4	12.9	9.4	9.1
Lumber and Wood products	16.8	11.4	5.6	3.1
Aircraft and Parts	7.0	18.5	1.0	3.2
Elec. Machinery	1.9	6.2	6.4	7.4
Ordnance and accessories	*	3.0	.2	.6

\* Less than 0.05%

625,000 tons. Production dropped off the latter part of last year and is still substantially below capacity. There were no changes in facilities last year, and none in prospect for 1960.

### Foundries

Business was good in southern California gray iron foundries last year until early October, when the effects of the steel strike began to be felt. Manufac-

turers of electrical machinery, agricultural implements and other equipment all bought heavily the first part of the year. Prospects for 1960 are bright. Population growth calls for larger orders, making more production runs possible. Therefore the next two or three years should see complete mechanization of the eight or ten larger foundries in the area.

Gray iron casing tonnage for 1958 in the Pacific states was 397,916 tons, in the mountain area 256,688, according to the Department of Commerce. For the first six months of 1959 the figures were 211,406 tons and 152,255 tons.

### Plastics

Western sales of plastics are estimated at more than 400 million pounds annually, with vinyl and vinyl copolymer resins at the top with 92,931,100 pounds, polyethylene resins second with 85,437,000 pounds, and phenolics and other tar-acid resins third with 43,978,900 pounds according to Western Plastics.

### Lumber

Output last year was above 1958, with prospects good for 1960, assuming that tightening in the money market will not curtail building. West Coast Lumbermen Association reports an estimated 8.4 billion board feet in 1959 as against 8.078 billion in 1958 and 9.135 billion in 1949. Western Pine Association counts on more than 9 billion feet, an all-time high. The 13 major mills reporting to the California Redwood Association, comprising 60% to 65% of the total output of 575 operating mills, totaled 575 million board feet.

### Plywood

Estimated production of Douglas Fir plywood for 1959 in the Pacific Coast was 7.7 billion square feet, figured on a 3/8 in. basis, a 20% increase over 1959. Estimated mill capacity for 1960 is figured at 8.8 billion feet initially and up to 9.5 billion feet by the year's end, and there were 145 mills in production at the close of 1959, compared with 127 a year ago.

### Electronics

Western electronics manufacturers are credited with 23.2% of the nation's sales, 18.7% of the employment and 17.5% of the number of firms. But they have a problem. They no longer can depend on four or five military customers. Soon they must learn how to sell to consumer markets. Small engineer-dominated companies may be in for an era of mergers so they can command equity capital.

On the brighter side, markets for data reduction and data processing equipment are widening in commercial and industrial fields as well as military. Refinements in transistors continue, and there are significant developments in magnetic tape.

### Electric Energy

A greater potential in northern California and northern Nevada than previously estimated caused

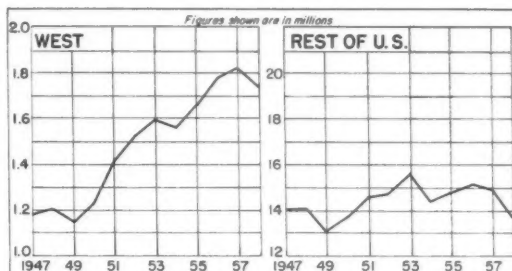
utilities to boost Western projections for future electric energy demand. Big steam generating plants in California and Arizona and smaller hydro installations elsewhere, all to be completed this year, will give immediate additional power. Unofficial Federal Power Commission projections are as follows:

Energy (billions of Kilowatt-hours)		Peak Demand (millions of Kilowatts)	
Pacific Northwest (includes Oregon, Washington, Idaho, Montana, Utah)	Pacific Southwest (includes Calif., Nevada, Arizona)	P. N.	P. S.
1960..... 70.6	72.7	1960.... 11.9	13.5
1970..... 121.1	136.3	1970.... 20.2	24.9
1980..... 181.8	222.9	1980.... 30.6	40.2

### Gas

An additional supply of 300 million cubic feet of gas daily, with a potential twice that amount, will become available for southern California next August. Trans-Western Pipeline Company's lines from the

### WEST'S MANUFACTURING EMPLOYMENT CLIMBS REST OF U. S. FALLS



Trend from 1947 to 1958  
(Figures in thousands) from Western Regional Office  
Bureau of Labor Statistics)

Year	Western States	Rest of U. S.	Year	Western States	Rest of U. S.
1947.....	1184.1	14,106	1953.....	1597.8	15,640
1948.....	1205.6	14,115	1954.....	1566.7	14,428
1949.....	1149.8	13,028	1955.....	1674.4	14,889
1950.....	1233.1	13,734	1956.....	1778.0	15,125
1951.....	1417.4	14,687	1957.....	1823.8	14,958
1952.....	1524.8	14,809	1958.....	1746.4	13,718

southwest Texas and Panhandle fields will join at Roswell, N. M. in a single 30-inch line to Needles, California. There it will connect with the 34-inch line of Pacific Lighting Corporation's transmission subsidiary, to serve Southern California and Southern Counties distributing companies. Pacific Lighting's Rock Springs project for a 34-inch pipeline from Wyoming, now awaiting Federal Power Commission approval, calls for 470 mcf by 1964, with a potential of 750 mcf.

### Rubber

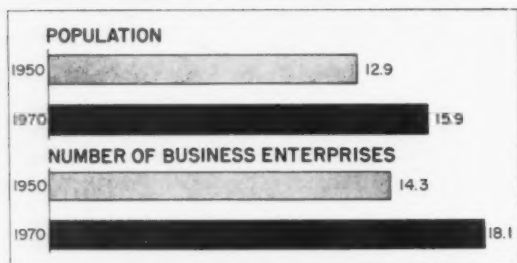
Sales increases for 1960 ranging from 7% to 22% according to Goodrich sources, are expected by principal distributors and users of industrial rubber products in the southern California area. This area ranks second only to Akron as a rubber manufacturing center. Rubber hose for aeronautical and industrial uses is expected to be up 8% to 15%. Passenger tire sales in the eleven western states are estimated to have ex-

ceeded 8,900,000 units last year. A high percentage of this volume was manufactured in southern California plants. National tire sales in 1960 are expected to be up 8%.

## Chemicals

After a dull period in which there was very little construction of chemical plants in the West, activity

WEST'S SHARE OF NUMBER OF BUSINESS ENTERPRISES GROWS FASTER THAN ITS POPULATION PERCENTAGE



Total Population of U.S. and Total Number of Business Enterprises each=100%  
West's growing share in each shown on chart  
(1950 figures from Department of Commerce; 1970 projections by National Association of Manufacturers, Western Division)

	Population		No. of Bus. Enterprises	
	1950	1970	1950	1970
West	19,561,525	34,995,400	574,700	978,856
U. S.	150,202,000	202,988,294	4,008,700	5,341,797

has been resumed and promises to continue. Sales of most lines for 1959 were well up over 1958. The steel strike affected sales of coal tar chemicals. Fertilizer volume continues upward.

## Oil

There was a marked increase in demand of oil in 1959 of 8½% or about 100,000 barrels a day. This resulted from the general business recovery plus a return to normal weather conditions in the Pacific Northwest. The 1958 temperature had been 15% above normal. Motor gasoline accounted for about 30% of the increase, plus fuel oil exports and shipments to the East Coast. These shipments decreased the Pacific Coast's surplus, although the decrease was partly offset by reduced military liftings.

For 1960 modest growth is expected, mainly in motor gasoline and jet fuel. Daily demand figures, for 10 months, in thousands of barrels, for the West Coast area, are as follows:

	1959	1958
Crude	16	8
Gasoline	575	554
Jet fuel	70	58
Distillates	190	173
Residual fuels	304	284
LP gas	40	43
Total	1,367	1,260

## Aircraft and Missiles

At the end of the third quarter of 1959, as reported by Aerospace Industries Association, West Coast aircraft employment was 360,000, slightly up from the

year before; payroll at \$47½ million, also up; backlog, \$6.78 billion, down from \$7.2 billion; and plant area 67 million square feet, up slightly more than one million feet. The backlog is about evenly divided for the first time, \$2.28 billion for aircraft and related, \$2.24 billion for missiles and related, \$2.25 billion for commercial aircraft.

Very few new military aircraft orders are being placed, but it will take two years to eat up the present backlog. Missile expenditures have sharply increased, but they are still going largely into research and development, rather than into hardware. What there is of the latter is mostly ground support equipment. It is expected that the decline in military aircraft output will be gradual. Although commercial production promises to stay at the same level this year, with deliveries scheduled into 1961 for some airlines, there may be a sharp decline next year. Except for Convair's new 880 and 600, which will both be certified this year, all companies are continuing to manufacture basically the same transports they now have.

## Passenger Trailers

One mobile home was sold in the U. S. in 1958 for every eight permanent housing starts according to the Trailer Coach Association, Los Angeles. In 1959 some 40,000 mobile homes and travel trailers were produced and sold in the West for a retail total of \$150,000,000.

## Shipbuilding

The Pacific Coast shipbuilding situation is much brighter than it was a year ago, with 15 freighters being built in California yards. Of these, six are being built at National Steel & Shipbuilding Co. at San Diego, five at the Todd yards at San Pedro and four at Bethlehem in San Francisco. Under the merchant marine replacement program, 55 ships are for West Coast companies. West Coast yards consequently have hopes of getting a good share of this business.

## Frozen Foods

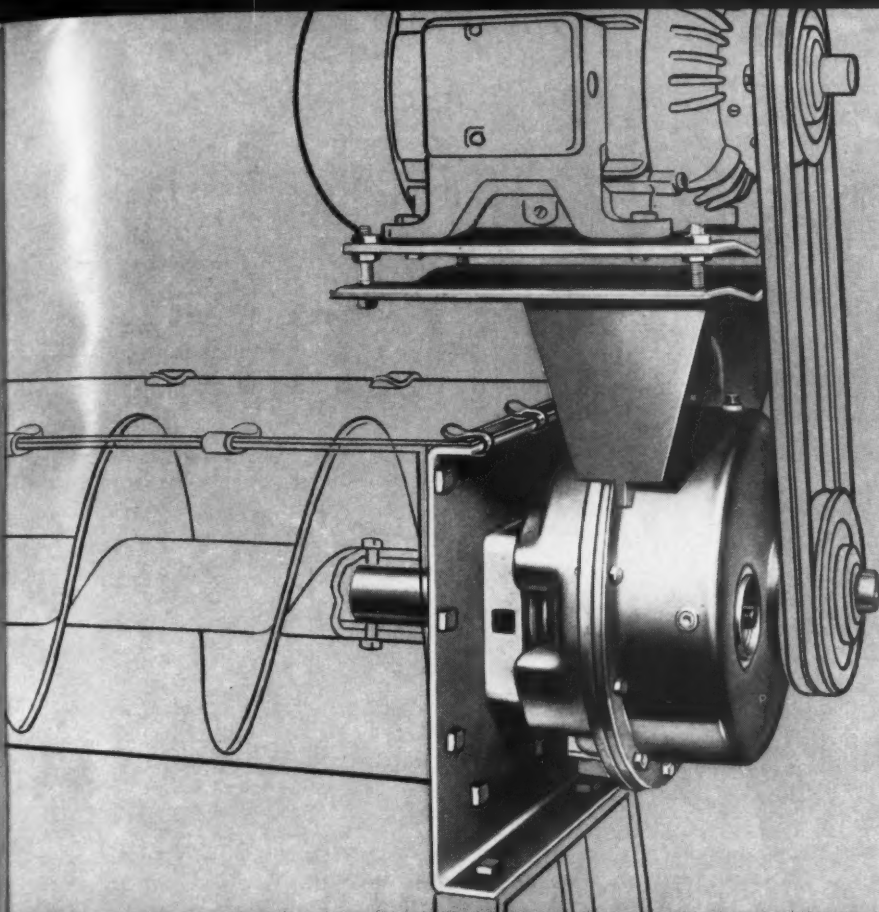
Packs in California and the Pacific Northwest last year were about even with 1958. California's 1958 total was 489 million pounds. Prices are firm with some advances. Movement has been better than expected. It appears that the no-profit bottom of the last three years has been reached and an upward turn started. The use of polyethylene bags in packaging gained momentum last season, one advantage being the ability to remove part of the contents and put the rest back in the refrigerator.

## Canning

Last year might have broken all records for California canned fruits and vegetables, however an unusually large cling peach crop dwindled before the packing season started. Then tomato packers, noting the big unsold inventory from last season, cut output 25%. Though prices have been low, demand is excellent, and the move-out of 12¼ million cases of peaches from June 1 to November 1 should be an all-time high.

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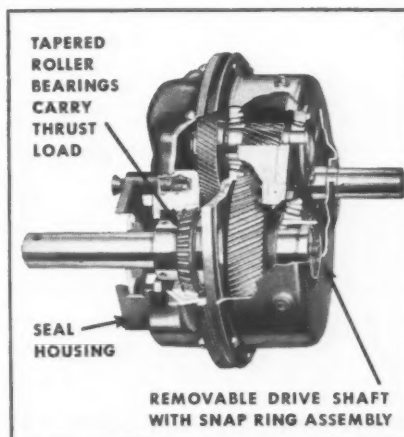
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WESTERN INDUSTRY/JANUARY 1960



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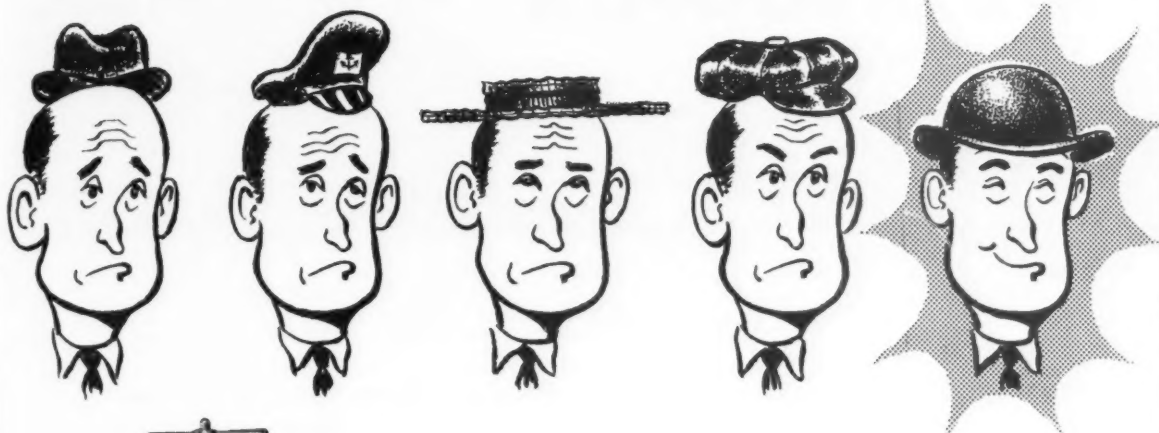
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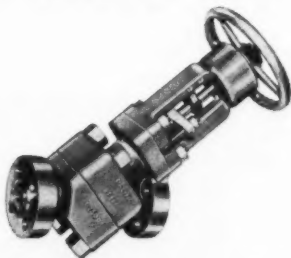




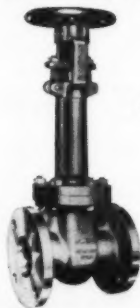
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# MATERIAL HANDLING SECTION

## cost reduction check list, case histories

The cost reduction check list below and the case histories on the following pages are for your use. They can help you solve your cost reduction material handling problems. The check list contains a number of important basic cost reduction questions on material handling. It is possible that in checking off this list against your material handling problem you may find a cost reducing solution. On the pages following this check list are actual case histories where other industrial firms have cut their material handling costs by utilizing some of the basic ideas in the check list below. For your convenience these examples have been keyed to the points in the check list.

Will new equipment cut handling costs? —

Can use of auxiliary equipment improve handling capability? (*CRANE FORK LIFT makes valuable handling tool. See page 24.*) —

Is handling equipment being used for improper applications? —

Are you using the correct containers? (*PORTABLE BIN takes place of hopper. See page 25.*) —

Can package shape be changed? (*RE-USABLE CONTAINER saves missile shipping costs. See page 25.*) —

Is there any backtracking or rehandling? —

Is there complete utilization of space? (*"ON END" LOADING doubles hauling payload. See page 26.*) —

Can low cost space be substituted for high cost storage space? —

Is material placed at right work height? —

Is line of flow straight with as little cross flow as possible? —

Can you combine the handling of the materials? (*VERSATILE SCALE prints weight, dumps load. See page 26.*) —

Can you change the handling sequence? —

Can the handling procedure be simplified? —

Can the handling be made more mechanized? (*BULK CEMENT one man, push button loading. See page 25.*) —

Are the materials being handled in unit loads? —

Can the number of unit loads be reduced by using larger units and equipment? —

Can you eliminate any manual handling? (*HANDLING SYSTEM does more, cuts cost. See page 24.*) —

Do loads, being received, go directly to production process when possible? —

Is there excessive travel distance in the handling? —

Can widely separated work areas be joined by conveyors? —

## CRANE FORK LIFT

### makes valuable handling tool

**A** FORK LIFT ATTACHMENT on an overhead traveling crane has eliminated the use of additional ground handling equipment and, because of its size and ability to operate in smaller areas, saved some 1,700 sq. ft. of valuable floor space. The device is used to handle skids of stainless steel at the metals warehouse of Ducommun Metals & Supply Co. in Berkeley, California.



*FORK USED in connection with crane cuts floor space needed by 25%.*

Operations at the metals warehouse required the use of traveling overhead cranes. Ducommun felt that since this was the case, the lifting power already available should be fully utilized for fork lift handling. They designed and had built to their specifications a fork lift, which could be easily attached to a crane. As designed, the device can carry loads up to 6,000 lbs. and is used to handle sheets that are stored in tree racks. This operation has proved to be extremely versatile. In case of interruption when the crane is needed elsewhere, the fork lift can be disconnected without removing the load, and, later, the operator merely connects to and picks up the already loaded fork.

A second advantage that has been realized through the use of the crane fork lift is its ability to operate in smaller areas. Aisles between tree racks formerly had to be 14 ft. wide. Now only 7-ft. aisles are needed. This has resulted in a savings of some 1,700 sq. ft. of floor space, or approximately 25% of the total floor space required for stainless sheet storage.

In design the crane fork lift resembles a "U" placed

on its side. The bottom side of the "U" is a regular fork lift. The top side is counterbalanced with a weight at the open end of the "U" and has, welded to it, near the closed end, a piece of steel with a large eye in it for the crane hook. Because of the opening's size and vertically elongated shape, the crane operator has been able to hook on to the fork lift without assistance from the ground.

## HANDLING SYSTEM

### does more, cuts cost

**A** MATERIAL handling and trash collection system installed by Riverside Cement Company, Oro Grande, California, has paid for itself in less than one year. An early survey of the system which uses Dempster-Dumpsters indicates a reduction of labor costs from \$14,000 to \$1,200 per year. Other advantages of the new system are: improved plant appearance, reduction of fire hazard, reduced dust and improved sanitation.

Formerly, barrels were used to collect loose raw material at various stations throughout the plant. These created numerous time consuming handling problems, fire and sanitation hazards and general appearance problems. Since the Company was in the process of establishing an overall automation program, they decided to reduce labor cost and equipment requirements in reclamation of loose material and trash collection.



*NEW TRASH COLLECTION and handling system at Riverside Cement Co. is centered around Dempster-Dumpster*

Under the new method, Dempster-Dumpster containers are used at strategic locations throughout the plant. In some instances, the material is wheeled and dumped into containers, while in others the material is piped or chuted directly into the containers. These are used for dry cement, lime, oil residue, scrap metal and trash. The hoisting unit is also used to carry cumbersome material such as large pipes and construction material.



## BULK CEMENT

### one man, push button loading

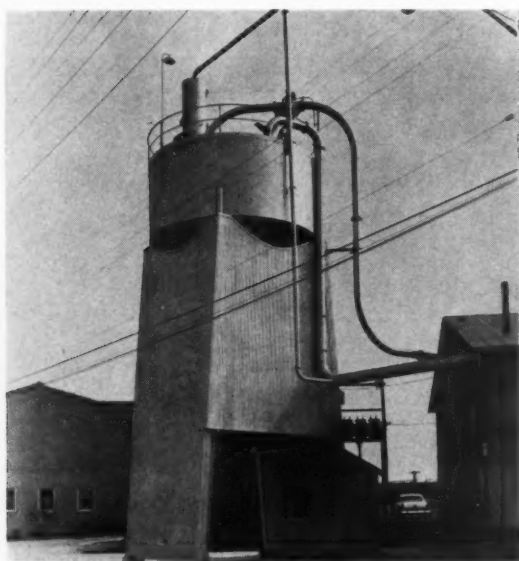
**K**AISER PERMANENTE CEMENT CO. is saving money and manpower through use of a centralized bulk loading depot that receives cement from a scattered group of plants and features automatic equipment that enables one man to load eight cement trucks in one hour.

All the single operator has to do is set the amount to be weighed and press a button, once for each truck.

This unique truck loader is found at the Kaiser Long Beach, Calif. facility that also handles bulk loading for ocean barges and railroad cars. Automatic equipment is housed in a tower-shaped structure fitted with a storage silo, a weigh tank, and a feed line for gravity delivery into trucks. All operations are conducted from a ground-floor control room.

Trucks pull directly underneath the loadout station, receive their load, and then turn directly into the street. The top silo has a 1000 barrel capacity, is compartmented into two sections for storage of two standard types of cement.

The sections are fed by a 10-in. pneumatic con-



*TRUCKS RUN BENEATH  
supporting legs of this  
loading station capable of  
loading eight vehicles in one hour.*

veying line running from the main storage silos at the depot. A remote control Fuller valve diverts the flow into either section of the top silo.

While trucks are loading, an industrial-type vacuum cleaner keeps the chassis free of loose cement

Each portion of the silo feeds, through its own gate,

into a weigh tank that empties a predetermined amount of cement into the truck. Heart of the weighing operation is a Fairbanks-Morse "Printomatic" weigher which controls the exact amount delivered and makes a printed record of date, time, weight, etc.

## PORTABLE BIN

### takes place of hopper

**A**T THE FERRY-MORSE Seed Company's Mountain View, California plant, a pair of Eriez electro-permanent magnetic HI-VI Vibratory Feeders, mounted back to back in an area of extremely tight dimensional limitations have proven the value of painstaking industrial design.

By eliminating any projection of the drive unit beyond the back of the tray, and due to the minimal space required for oscillations, the feeders could be mounted with their bases almost touching.

As a result, Ferry-Morse was able to eliminate the fixed hopper. In the old system, both hopper and conveyor had to be laboriously cleaned of all remaining seeds before seed of a different type could be packaged. Now, the portable storage bins themselves are simply lifted into position above the feeders which automatically feed the packaging operation at a precise, uniform rate of flow.

## REUSABLE CONTAINER

### saves missile shipping costs

**A** NEW SHOCK RESISTANT shipping container with a high reusability factor is capable of offering 100-fold savings over one-time usage packaging for the Navy's critically important fleet Ballistic missile, the Polaris, according to Lockheed Aircraft Corp. production men.

The three-story high containers, currently being built at the Burbank, Calif., plant, are double-lined cylindrical packages that are pressurized and will protect the missile from temperature variations during transit and storage.

The container will help reduce shipping costs also since it is readily adaptable and can be carried by air, rail, truck transport. The package will weigh approximately 11 tons, empty.

The interior is fitted with a fiberglass inner liner that is electrically heated. Beneath this is a two-inch foamed-in-place plastic insulating layer, and the exterior is formed from aluminum alloy. Approximately \$1 million worth of precision tooling is involved in fabricating the missile carrier.

Inflated air cushions are placed between the aluminum outer skin and the plastic and fiberglass inner

container. This will dampen vibration that could disturb control settings inside the missile.

Zenith Plastics fabricated the fiberglass lining using one of the largest plastic-impregnated tape wrapping machines in the country. The pneumatic cushions were supplied by Goodyear Tire and Rubber Co. and the foam plastic insulation by American Latex Co., under license from Lockheed.

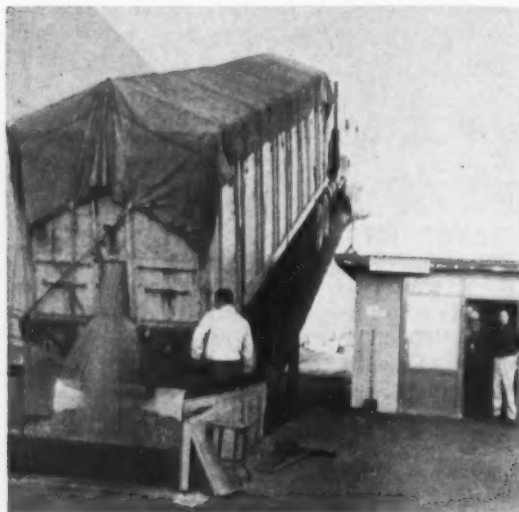
The missile is loaded into the container and carried to the dockside or to storage "on the shelf" until it is actually loaded aboard the Navy nuclear-powered Polaris-class subs.

## VERSATILE SCALE

### prints weight, dumps load

**W**EIGHING, imprinting the weight directly on the waybill, and unloading of large tractor-trailer trucks is accomplished in one operation at Diamond Walnut Growers processing plant in Stockton, California.

From collection and primary processing stations throughout the state, walnuts are shipped to Stockton.



*AFTER WEIGHING and imprinting waybill, scale is slowly raised up to 30 deg. while dumping load in drag conveyor system.*

While much of the shipping is done by rail, trucks are also utilized. To reduce handling costs on loads shipped by trucks, plant engineers at Diamond Walnut Growers have developed a multi-purpose scale and weighing platform.

When a truck reaches the plant it drives onto the weighing platform. Using a specially built Murphy scale the truck is weighed and the gross weight im-

printed directly on the waybill, rather than on a separate weight ticket. The tare is also imprinted on the waybill after the truck is empty.

The weighing platform has a high steel stop at the rear. When the front of the weighing platform is raised by means of a hydraulic lift, and a gate opened at the rear of the truck, the load is dumped by gravity, onto a drag conveyor. During the dumping process the truck is raised to an angle of 30 deg. by the hydraulic lift. The drag conveyor onto which the load is fed, carries the walnuts either to one of the plant's storage bins or directly to the plant for processing as such is desired.

## "ON END" LOADING

### doubles hauling payload

**A** NEW FRUEHAUF Volume Van coupled with an "on end" loading technique has enabled the International Furniture Company Corona plant to increase its load from 24 sets of living room furniture to from 40 to 48 sets per trailer load.

Use a standard Fruehauf furniture van of 13' 6" height and stack sofas and chairs on end.



*NEW METHOD of loading in standard high van doubles payload. Personnel in photo loads furniture on end.*

As simple as this now seems, it took many months of experimentation by Smiley and Fruehauf engineers to work out the combination. When the idea was born, Fruehauf loaned International a van with which to experiment. Hours of figuring on paper were followed by actual loading tests. It became a mathematical problem—get a van high enough to accommodate two pieces of furniture stacked on end, with no wasted space!

The result was that with standard size furniture, the payload was actually doubled.

# PRODUCTION EQUIPMENT SECTION

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## cost reduction check list, case histories

The cost reduction check list below and the case histories on the following pages are for your use. They can help you solve your cost reduction maintenance problems. The check list contains a number of important basic cost reduction questions on maintenance. It is possible that in checking off this list against your maintenance problem you may find a cost reducing solution. On the pages following this check list are actual case histories where other industrial firms have cut their maintenance costs by utilizing some of the basic ideas in the check list below. For your convenience these examples have been keyed to the points in the check list.

Can you do the same job with smaller or less expensive production equipment? \_\_\_\_\_

Can you use a different type of production method or equipment? (*NEW METHOD high speed milling. See page 29.*) \_\_\_\_\_

Is your production machinery utilized to its fullest capacity? \_\_\_\_\_

Are production machines and equipment grouped for maximum efficiency? \_\_\_\_\_

In case of equipment failure do you have ability to continue production? (*BRAZING BLANKET finishes run when die fails. See page 30.*) \_\_\_\_\_

Is there proper illumination for the job? \_\_\_\_\_

Are you using the correct equipment for the length of your production runs? \_\_\_\_\_

Can you increase length of production runs through design standardization of parts? \_\_\_\_\_

Is your production line flexible to handle different types of production? \_\_\_\_\_

Is method of production control efficient, or outmoded due to rapid plant growth? \_\_\_\_\_

Can you increase production by using a jig or fixture? (*UNITIZED WIRING speeds production. See page 28.*) \_\_\_\_\_

Can you solve your production problem through the use of a special machine? \_\_\_\_\_

Do you need to use more automaticity in your production equipment? \_\_\_\_\_

Can you save money by using newer more efficient production equipment? (*BELT SANDER cuts cost, improves quality. See page 28.*) \_\_\_\_\_

Can your production operation be speeded up by better tooling? \_\_\_\_\_

Do you need additional inspection or quality control equipment to cut down production rejects? (*FEWER REJECTS, welding temperature controlled. See page 29.*) \_\_\_\_\_

Can you eliminate operations by using a more expensive or semi-finished material in the production process? \_\_\_\_\_

Can you use a different, less costly, material for production? (*BETTER SURFACE from hot rolled steel. See page 29.*) \_\_\_\_\_

## UNITIZED WIRING

### speeds production

A SIMPLE PRODUCTION technique which simplifies wiring of large terminal bays used in comparators is being used at Librascope, Incorporated. One of the most difficult processes to simplify in electronic production has been wiring itself. The necessity for proper positioning of what can be literally thousands of separate leads has defied any attempts at automation, or even use of simple mechanical aids for the assembler.

Since large terminal bays are used throughout the massive computers and data processing systems produced by Librascope, the industrial engineering department developed a simplified production approach to the problem.

A two-phase assembly program was developed. Rather than requiring a worker to stand at the cabinet and wire the entire bay, the connectors have been grouped in three panels, which are individually wired at benches where the worker may sit and work under optimum lighting conditions. At the completion of wiring, the separate units are bolted into the cabinet to form one large bay, and inter-connections between the separate panels are quickly completed.

The two-stage assembly permits a greater number of wirers to work on the terminal bays. It reduces fatigue and errors during the placement and connection of the thousands of insulated wires which must



*INDIVIDUAL terminal sections for data processing equipment are wired at benches where workers sit and work under optimum lighting conditions.*

follow a direct point-to-point path from one terminal to another.

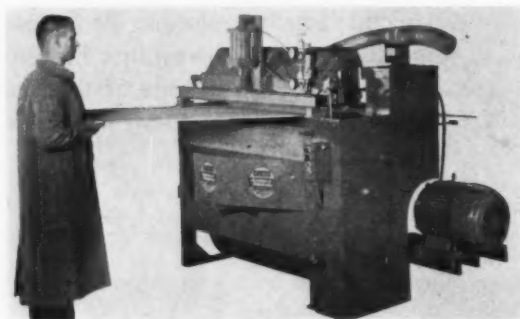
The Company recently pioneered in the adoption of solderless crimped connectors, for many circuit applications. This has effectively increased production by more than 30% and has reduced the necessity for "workover" of improper connections to a minimum.

The advanced techniques and equipment now in use have cut lead time on contracts by as much as 25% and saved customers thousands of dollars on purchases on systems.

## BELT SANDER

### cuts cost, improves quality

HIGH PRODUCTION and lower per-unit costs have been realized by Harold R. Jones' Multi-Use Panel Corp., Eugene, Ore. with a new high speed sander developed by Carborundum's Curtis Machine Division for use with wide abrasive belts.



*WORKMAN INSERTS WOOD STOCK into model 150-R-1 Sand-O-Matic that has a rate of feed up to 150 fpm, holds tolerances to .005-in. or less.*

Called the model 150-R-1 Sand-O-Matic machine, it has increased production from 30 linear ft. per minute, common with conventional drum sanders, to 150 ft. per minute.

The company has found that along with speed has come an upgrading of quality with wood receiving a finer finish that is free from burn and oscillation marks. Multi-Use has been able to convert part of their production from standard fir plywood to hardwood paneling and this has improved their competitive standing in the market.

By using a Luminex cloth belt with the sander, the firm has found it possible to produce and distribute factory-sanded and finished wood paneling at half the cost of other pre-finished items.

The Sand-O-Matic can be used for lumber, plywood, chipboard and other materials ranging from 1/20-in. to 3-in. in widths up to 48-in. Infeed ratios are from 30 to 150 linear fpm and stock removal of course is variable with hardness of contact roll and grit size on the abrasive belting.

Production tolerances can be maintained within .005-in. or less.



## NEW METHOD

### high speed milling

**A** NEW MILLING PROCESS for trimming Armco PH 15-7 Mo stainless steel alloy has potential applications for machining ultra-hard thermal resistant metals that could conceivably save millions



*OPERATOR CHECKS new high speed milling process which uses routing head, climb cutting, carbide tooling, and liquid carbon dioxide tooling.*

of dollars throughout the defense industry. The process was developed by manufacturing research engineers in the Aero-Space Division, Boeing Airplane Company.

The process combines the high speeds of routing with the mechanical feeds, cutting pressures and solid fixturing of standard milling practices; plus climb cutting, carbide-brazed cutting tools and liquid carbon dioxide cooling on both cutter and point of machining.

A standard knee-milling unit equipped with a high speed routing head was used. Cutter speeds as high as 7,000 rpm and feed rates up to 180 inches per minute were achieved. As much as 60 lineal feet of annealed .125 inch PH 15-7 Mo with tensile strength of 130,000 psi were test trimmed in a matter of minutes before tool failure.

The new process is expected to increase production rates a hundred fold with similar significant increases in tool life. New areas of application in machining the "unmachineable" new steels, nickel-base and cobalt alloys and other metals designed to withstand the high temperatures of hypersonic flight will be explored. Tests in the immediate future will determine maximum and minimum thickness that can be milled and how big a cut can be taken. PH 15-7 Mo sheets heat treated to tensile strengths up to 220,000 psi are being evaluated. Both numerically controlled and hydraulically controlled profile mills can be adapted to use the new process.

## BETTER SURFACE

### from hot rolled steel

**S**AVINGS UP TO 33 1/3 % have been realized by aerospace manufacturers including Douglas and North American Aviation through use of a new process called Chem-Size, developed by Anadite Inc., South Gate, Calif., and allowing firms to use less expensive steels for critical structures.

The process involves use of hot rolled stainless steels, previously considered unsuitable for structural use due to poor surface conditions. The Chem-Size process has been developed to create a high grade surface for hot rolled items, eliminating pits and scale, and bringing the steel up to aircraft quality tolerances.

On the production line time savings have been realized since the Chem-Size cycle more than doubles the size of parts that can be fabricated from a single piece of hot rolled material. At the Anadite South Gate facility, parts can be processed up to 12-ft. by 25-ft.

In the past, average materials used that would pass critical surface specifications were cold rolled and rarely exceeded 36-in. in width. As many as eight pieces of cold rolled stainless had been pieced together to form large-surfaced items. These can now be fabricated at a much reduced cost from a single sheet.

## FEWER REJECTS

### welding temperature controlled

**T**HE PIERCE WELDING Company has developed a simple technique for temperature measurement to reduce costs and increase quality. Being located near a group of electronic organizations, the Company is called upon to do a large number of unusual jobs in which temperature control has proved to be an important factor. Some of these include the handling of critical alloys, copper, and other difficult materials.

One of these jobs was a project which involved the fabrication, from solid copper, of shielding enclosures for delicate electronic instruments. Formed units were pre-heated to eliminate heat-conductivity problems, but experience showed that chemical methods of heat measurement were not precise enough to produce faultless welds on every unit.

The solution to the problem was found in the Pyro-tem, a simple temperature measuring instrument, having a probe and meter integrated into a single unit and manufactured by Royco Instruments, Inc., a neighboring firm and customer. This meter, operating on the thermocouple principle, is self-contained and self-powered, requiring no batteries, maintenance or calibration. Inherent in the design is automatic compensation for ambient temperature so that comparative readings and computations are not needed.

Pierce Welding found that by using one of these instruments the temperature of a pre-heated unit

could be identified within 2% of full scale reading, or 20 degrees, which gave the control needed to produce perfect welds on the copper housing.

Soon other advantages were discovered in the use of the instrument. Where jobs were being furnace pre-heated for welding, temperature problems frequently arose, particularly when several passes were required to complete the weld. This was especially



*CHECKING THE temperature of a weld is quick and easy using the Pyro-tem Model DTR-1000. Probe is placed on the weld and a direct reading taken from the dial.*

troublesome when the assembly of parts increased the bulk of the partially finished piece beyond the size of the furnace. Use of chemical methods for temperature checking not only failed to give adequate control but introduced foreign substances which were absorbed into the metal surfaces. Elimination of this contamination by use of the Pyro-tem resulted in a general improvement in weld quality. Making frequent spot checks with the Pyro-tem permits control of welding current and welding speed to the point where the proper temperature is maintained.

## BRAZING BLANKET

### finishes run when die fails

**A** HIGH temperature electric blanket developed by Rohr Aircraft Corp., Chula Vista, Calif., and Electro-film Corp., North Hollywood, Calif., as a more economical and flexible method of brazing stainless steel structural honeycomb has turned out to have an unexpected cost saving application on B-52G Titanium pod firewalls.

When a die used to hot form these tricky Titanium parts failed, electric blankets were called in to handle the emergency and to keep the production line from closing.

The die was used to creep-form the firewalls in a process that took more than two hours. To repair or replace the die would mean costly delays and was

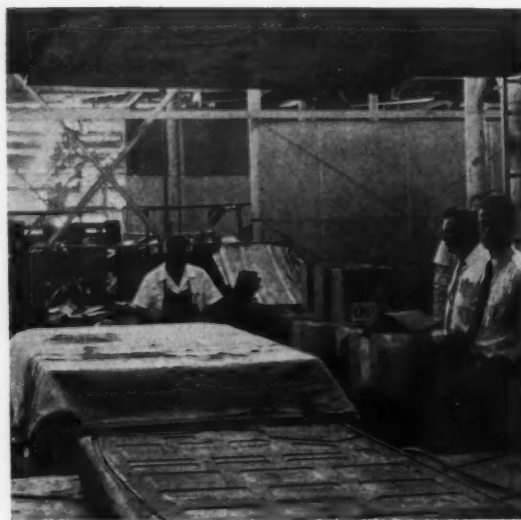
uneconomical since plans called for production of only 64 additional parts.

Production men from the fabrication line huddled with engineering laboratory specialists and decided to attempt the job with electric blankets, heating the die in a furnace and forming the blanket-heated Titanium in a Cecostamp unit.

Four brazing blankets were positioned within easy reach of the stamp. These were used to bring the .016-in.-thick, 39 by 57-in. sheets to process temperature.

Using procedures similar to those in brazing honeycomb, the blankets were setup with a bed of insulating block at the bottom and with retrocel pads for side and top insulation.

When the die reached the proper temperature it



*TITANIUM SHEET is being readied under pile of electric blankets, rear. In foreground is pre-heated die laying in bed of Cecostamp.*

was placed in the stamp, then the pre-heated Titanium sheets were positioned over it and the forming operation was performed.

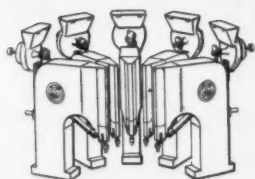
Thermocouples recorded Titanium sheet temperature and it was found that 15 minutes was needed to bring them to the necessary 1100° F.

As soon as the sheets reached optimum temperature, they were pulled from underneath the electric blanket, and with some insulation to retain heat, were transferred to the die.

After preliminary trial and error the procedure was refined to a point where quality parts were being produced. Fast handling was needed to jockey the Titanium sheet to the die without heat loss.

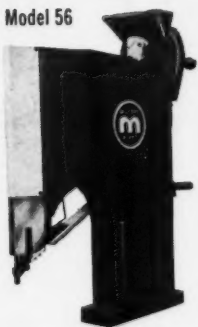
The run of 64 parts was completed with little waste and the pod production line was able to operate.

This emergency application has opened up new potential for use of blankets for forming, stress relief on weldments, and other types of short notice service.



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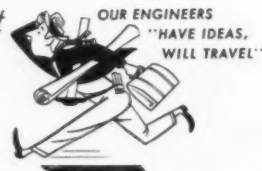
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# MAINTENANCE SECTION

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## cost reduction check list, case histories

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Can an item requiring constant maintenance be changed or redesigned? (*TRUCK WHEEL cuts floor wear, lasts longer. See page 36.*)

Is new equipment for plant or production use designed with built-in maintenance to reduce costs? (*SPRAY BOOTH eliminates maintenance shutdowns. See page 35.*)

Is your larger maintenance equipment portable so it can be taken to the job?

Do you have complete maintenance equipment for the job? (*CUTTING CONCRETE powder lance saves 30%. See page 35.*)

Should your maintenance equipment be more automatic? (*INDUSTRIAL SWEEPER covers 100,000 sq. ft. hourly. See page 35.*)

Do you carry spares on key parts and items to eliminate costly waiting?

Do you have a complete industrial lubrication program?

Can plant layout be altered or plant equipment be relocated to cut maintenance costs?

Are you losing money on specialized jobs done better by outside specialists?

Can your maintenance equipment be made more efficient? (*LEAK DETECTOR checks large tanks quickly. See page 36.*)

Will the use of a different material cut maintenance job time or cost, or prolong replacement life? (*SEALING TAPE cuts installation time one-fourth. See page 34.*)

Can you save repair time, make better use of personnel, through better communications?

Will the use of a different part or process cut maintenance time, cost, or prolong replacement life? (*REMODELING COSTS CUT by foamed-in-place insulation. See page 34.*)

Are your order and storage systems for spare parts and materials effective?

Are production equipment, plant fixtures, etc., standardized for faster, easier repair or replacement of parts?

Do you have a planned system of preventive maintenance for both plant facilities and production equipment?

## SEALING TAPE

### cuts installation time one-fourth

**S**AVINGS IN COSTLY man-hours devoted to plant maintenance and construction have resulted through introduction of a synthetic rubber tape, U S Rubber U-100 sealing tape, used for gasketing, sealing, anti-squeak buffering between metal surfaces and in curtain-wall construction.



*EXTRUDED ALUMINUM structural shape is fitted with tape prior to placement in panel assembly. Tape insulates, seals, prevents metal-to-metal abrasion.*

The butyl-based tape has been used on projects ranging from small plant utility buildings to the huge Tishman and California Bank skyscrapers in Los Angeles.

In a typical curtain wall installation, use of the tape allows ironworkers to install porcelain or other type exterior panels in about one-fourth the time normally needed.

Formerly they had to undo as many as 12 screws, place the panels in place with four aluminum beads, then refasten the screws. Using U-100 tape, they are able to eliminate use of screws and merely put lengths of rubber tape on the beads that snap into place on each side of a panel for permanent installation.

Tape in any application resists oxidizing and hardening, has virtually permanent flexibility, and offers excellent adhesion to a variety of surfaces including glass, aluminum, and brass.

Ozone resistance and weathering properties, both important in Western industrial areas, are good with tape remaining flexible at -76°F, holding stability up to 150°F and withstanding intermittent readings up to 300°F without loss of structural quality.

Exposed to ozone concentrations 15-times greater than those found in the Los Angeles basin, the tape showed no signs of deterioration. It can be used in a variety of industrial applications requiring tape up to 30-in. wide. Thicknesses range from 1/32-in. to 3/16-in. and rolls are shipped in 6-in. and 12-in. OD sizes.

## REMODELING COSTS CUT

### by foamed-in-place insulation

**A**S PART OF a remodeling and expansion program at Knudsen Creamery Co., Los Angeles, about 1000 lbs. of foamed-in place No. 1901 Stafoam polyurethane was used for insulating refrigerator walls at a saving of \$2000 over other types of insulation.

Walls to be insulated were tiled five feet above the floor to permit constant washing for sanitation. Insulating them with conventional materials and methods proved impractical since the tile facing had to be removed along with plaster in order to allow access.

Blown-in, granular types of insulation could be used without tile removal but it had a tendency to pack and absorb moisture, a hinderance to refrigeration.

The solution was polyurethane furnished by American Latex Products Corp., Hawthorne, Calif. Mixture used was a 3-lb. density, low exothermic, slow mixing formulation that generated little foaming pressure and requires no heat curing.

The substance was forced into the walls through a hole in the double ceiling using a portable foaming machine (Stafoamer) and a mixing head that is lifted to the access hole.



*MIXING HEAD is handed to man on wall, wearing mask. Blower tubes, right, help remove gases generated during reaction of components. Tank and mixing apparatus are at lower left.*

As the polyurethane foams, the slight pressure of reaction thoroughly forces foam into every crack and orifice in the wall, completely sealing it. Since the substance is an excellent electrical insulator, it does not affect operation of switches and electrical gear imbedded in the wall.

## SPRAY BOOTH

### eliminates maintenance shutdowns

**T**HE PROBLEM OF avoiding complete shutdown of paint spray booths for periodic maintenance has been solved by Western Gear Corp., Lynwood, Calif., with a newly installed SprayKing spraying and curing facility, built at lower initial cost and featuring ease of upkeep.

The equipment is used to coat and heat cure various geared components with a wide assortment of fungus, sand, grit, salt water, and weather resistant finishes.

Dual SprayKing "Superclean" paint booths were installed as a replacement of a water-wash system. Im-



*OPERATOR APPLIES special purpose paint to hoist component. Bank of 16 paint arrestor pads, rear wall, is replaced monthly.*

mediate cost advantages were realized since no plumbing was necessary, the new units do not have to be completely shutdown for lengthy periodic cleaning and draining of water tanks. Paint arrestor pads, that supplant the water wash system, can be cleaned easily each day and need only monthly replacement that takes a few hours.

The booth interior is sprayed with a tough, plastic coating that can be stripped off and reapplied when soiled.

Booths are equipped with a paint overspray arrestor system to collect overspray before it reaches exhaust ducts, thereby cutting fire danger and avoiding damage to adjacent objects. Exhausters are equipped with fans that reduce noise level. Fluorescent lighting from overhead covers the product to be sprayed with shadow-free light.

No insulation is necessary other than air circulated between inner and outer walls with a blower system that also removes fumes. The oven features rapid temperature rise, 30 minutes as compared with 3 hours formerly, because of direct radiation rather than the convection method where air is heated that in turn heats the object to be cured.

## CUTTING CONCRETE

### powder lance saves 30%

**A** PROCESS called powder-lancing is speeding an unusual demolition project at Hill Air Force Base near Ogden, Utah, by slicing through 18-inch thick reinforced concrete walls in record time.

The lancing process, developed by Linde Company, Division of Union Carbide Corporation, is employed to cut doorways in the concrete walls of a 59,884 square foot engine test building which is being converted into additional maintenance facilities for the base.

In powder-lancing, a mixture of iron and aluminum powder is fed pneumatically into a lance handle and mixed with oxygen. The lance is manually operated and consists of a lance handle with one or more lengths of consumable black iron pipe attached. The powder and oxygen are mixed in the lance handle, carried to the cut by the pipe, and ignited to produce an intensely hot (5,500 deg. F.) bombardment of burning particles which melts the concrete.

On the Hill AFB project, two men using powder-lancing cut a 10 by 10 foot opening in the thick walls of the building in one 8-hour day. In sharp contrast, jackhammer crews required 10 days to cut out an identical doorway.

Air Force officials figure that the cost of powder-lancing each 100 square foot opening is \$352 and they expect the total expenditure to run 30 per cent less than conventional demolition techniques.

## INDUSTRIAL SWEEPER

### covers 100,000 sq. ft. hourly

**T**HE MAINTENANCE OF large exterior areas including plant parking lots and storage space involves the costly process of rubbish pickup and elimination of broken glass, nails and other refuse that can cause injury to worker and damage to equipment.

A number of Southern California plants, among them Aerojet General Corp., Continental Can Co., Hughes Aircraft, and Young's Market Co., have employed a newly designed industrial power sweeper, the "Task Master 42" to cut exterior maintenance costs, time, and manpower.

The sweeper, built by Patch & Case Corp., Azusa, Calif., permits one operator to clean between 75,000 and 100,000 sq. ft. of space per hour. The Task Master will handle heavy refuse and can function over an irregular surface.

It covers a 70-in. sweeping path and has operational speeds from 1 to 15 mph. Power steering allows sweeping in tight corners and otherwise inaccessible areas. Puncture-sealing tires cut down time, allow sweeper use in scrap and metallic litter.

## TRUCK WHEEL

### cuts floor wear, lasts longer

**A**NNUAL savings as high as \$4,000 in floor repair bills and reduced wear to industrial truck wheels have been reported by users of the Disogrin Industries Disowheel tire, available in both pallet and press-on sizes.



*THIS PATCH of worn floor is the result of using hard-surfaced wheels. Disowheels prevent this damage, are abrasion resistant*

Typical of Western firms switching to use of the Disowheel on industrial trucks is the Pillsbury Co., Los Angeles plant, where cracked and damaged floors were eliminated and the rate of wheel failure and replacement sharply cut.

Pillsbury's plant engineers had used a variety of wheels on loading equipment with negative results including pitted floors, flattened wheels due to heavy loading, and chunking-out of tires so that wheels would become inoperative.

This caused serious time lags and due to the perishable nature of the food products handled including cake mixes, and frosting mixes for a variety of home made dishes, a more efficient and quick-moving material handling operation was necessary.

The firm switched to the Disowheel for replacement of load wheels on the plant's five pallet trucks moving heavy sacks of flour, sugar, salt, soda, shortening, spices and other materials to the production line.

Trucks were also used in moving cases of the finished product to loading docks. Under these operating conditions the Disowheel has been used for over a

year without evident wear that would require replacement, nor has the wheel damaged flooring.

## LEAK DETECTOR

### checks large tanks quickly

**S**PACE AGE standards of quality control and close tolerances in fabricating assemblies, sub-assemblies and components of tankage, manifolding, and pressure vessels has demanded use of low cost and rapid methods of leak testing.

The answer has been the mass spectrometer-type leak detector, sensitive to a tracer gas, usually helium, that is pumped into the structure to be probed for leakage.

Many Western firms using this instrument, made by Consolidated Electrodynamics Corp., report cost saving advantages over older, cruder and less sensitive leak detection methods such as immersion in soapy water, bubble watching, and hydrostatic testing.

Size of the product is no barrier to helium leak testing. Superior Tank and Construction Co., Los Angeles, uses a Consolidated leak testor for trailer tanks for liquid oxygen, butane and propane. Some of these units are 8-ft. OD and up to 40-ft. long.

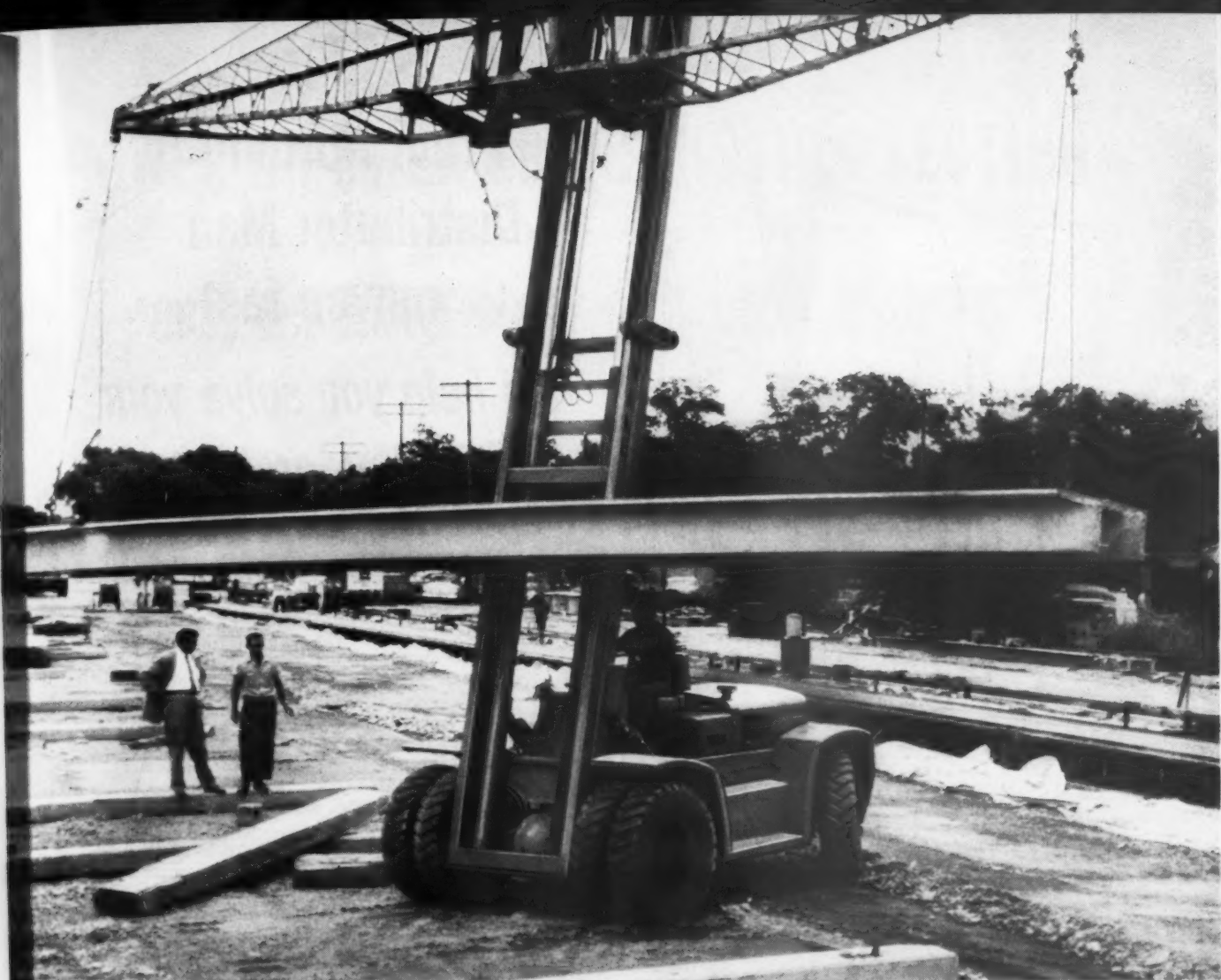


*TINY LEAKS in large containers and tanks can easily be located with this leak detector, cutting production and maintenance costs.*

Superior has the CEC 24-210A leak detector operating on standard 105-125-Volt AC, 60 cps. Helium is used as a tracing medium as it is non-toxic, non-explosive, is readily available and its molecular structure will allow it to penetrate through smaller physical leaks than nearly any other type of tracer gas.

At Superior, tanks are pumped with 70% air, 30% helium by volume to a pressure of 30 psig so that there is pressure differential across the tank shell. An operator holds his probe up to any possible leak points such as welded joints. If instrumentation spots a leak it is marked so that a welder can quickly plug it.





**Yale G-3 gas trucks** are specifically designed to handle the toughest assignments in the 15,000 to 20,000-lb. area. Their heavy-duty ruggedness is ideal for rough or smooth terrain. With the G-3 Gas Truck, maximum visibility is assured through exclusive dual lifting cylinder design—300% greater visibility than any other truck of its type. The G-3 Gas Truck also gives maximum maneuverability and stability, due to a low center of gravity combined with rugged upright channel design. The G-3 turns easily, especially in tight areas.

For full information, call your Yale representative or send for free brochure #5230B to The Yale & Towne Manufacturing Co., Materials Handling Div., Philadelphia 15, Pa. Dept. GT5.

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# POWER & POWER TRANSMISSION SECTION

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## cost reduction check list, case histories

The cost reduction check list below and the case histories on the following pages are for your use. They can help you solve your cost reduction power problems. The check list contains a number of important basic cost reduction questions on power. It is possible that in checking off this list against your power problem you may find a cost reducing solution. On the pages following this check list are actual case histories where other industrial firms have cut their power costs by utilizing some of the basic ideas in the check list below. For your convenience these examples have been keyed to the points in the check list.

Is your power source or unit large enough to take care of future power increases? \_\_\_\_\_

Are you getting top efficiency that more up-to-date equipment brings. (*PULSATING BURNER cuts fuel, melt time. See page 42.*) \_\_\_\_\_

Will more automatic equipment save money? \_\_\_\_\_

Are your controls centralized? \_\_\_\_\_

Can some of the equipment be placed outside to save space? \_\_\_\_\_

Can a part change improve efficiency? (*CAST FITTINGS resist furnace corrosion. See page 41.*) \_\_\_\_\_

Are power units and parts designed for trouble-free use? (*VALVES LAST LONGER, long wearing seats and disks. See page 41.*) \_\_\_\_\_

Can power equipment be maintained and adjusted with ease? (*TURBINE BEARINGS, adjusted using hoist control. See page 40.*) \_\_\_\_\_

In converting from electrical power to another type of power is the conversion location at the correct point? \_\_\_\_\_

Can mobile power plants be used to advantage instead of stationary units? \_\_\_\_\_

Is power transmission installation planned as a coordinated unit? (*CAPACITY PRESS LOAD, gear motor adapts to power need. See page 41.*) \_\_\_\_\_

Can a special piece of power transmission equipment solve your problem? (*DRY FLUID DRIVE saves \$1,230 a year. See page 40.*) \_\_\_\_\_

Are power transmission units standardized for easy replacement? \_\_\_\_\_

Are you using the correct belting or "V" belts for the job? \_\_\_\_\_

Are belts kept at correct tension for maximum efficiency, minimum replacement? \_\_\_\_\_

Are you using the correct type of power for the job? \_\_\_\_\_

Is there an advantage in using compressed air? \_\_\_\_\_

Can hydraulic power be used to advantage? \_\_\_\_\_

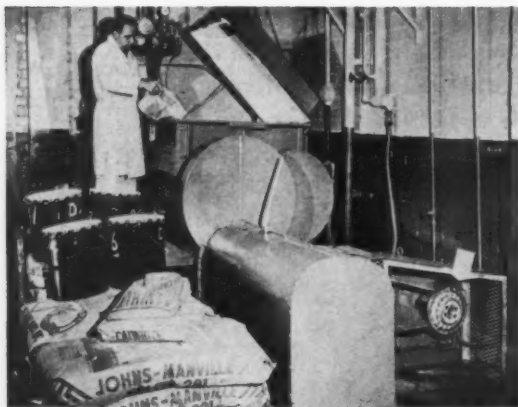
Is there an advantage in using mechanical power? \_\_\_\_\_

Do you have a standby power source in case of power failure? \_\_\_\_\_

## DRY FLUID DRIVE

saves \$1,230 a year

**A**T PRODUCTS RESEARCH Company, Los Angeles, California, where gaskets, tapes, sealing compounds and other similar materials are produced there was a constant overloading problem on the mixer used to prepare the heavy and viscous material needed for aircraft fuel tank sealant. Demand for



*MIXER OVERLOAD PROBLEMS have been eliminated in a California manufacturing plant with the installation of a Dry Fluid Drive. Estimated annual saving is \$1,230.*

the material, moreover, called for the mixer to be in service 24 hours a day.

Production was halted for mixer repairs about four or five times a year. Gears and bearings had to be replaced about every three months on this big mixer, which was subject to frequent shock loads and often had to take as much as 200 per cent overload.

A simple and inexpensive solution to the problem was worked out with the installation of a Flexidyne Dry Fluid Drive on the shaft of the 25 hp. electric motor, connecting it with a four-speed transmission through V-belts and sheaves. This was in the summer of 1956.

Since then the mixer has worked perfectly. Designed to deliver "soft" starts to all kinds of machinery, the dry fluid drive by Dodge Manufacturing Corporation, Mishawaka, Indiana, has made it impossible to overload or shock load the equipment to the point of breakage.

Earl B. Jackson, plant and production engineer for Products Research, estimates that maintenance costs during each year of operation with Flexidyne were reduced by \$555, and that mixer down time worth about \$675 was eliminated. The total saving of \$1,230 per year is about four times the cost of the improved drive.

## TURBINE BEARINGS

adjusted using hoist control

**P**RECISION ADJUSTMENT of bearings on a large steam turbine can be a difficult maneuver involving costly man hours and no margin for error. To help cut costs during alignment of these heavy components, the City of Los Angeles Department of Water & Power has used a 10-ton capacity Hydra-Set auxiliary crane and hoist control from Mefco Sales and Service, Arcadia, Calif.

For example, a 10-ton Hydra-Set was used to help in adjusting bearings of a 100,000 Kilowatt steam turbine at the Valley Steam Plant, Los Angeles.

During the operation the device accomplished two things. It provided for lifting and lowering the turbine shaft in increments of .001-in. for every stroke of the operating handle.

It also weighed the shaft as it was being lifted and immediately disclosed any friction or obstruction. This was of vital importance due to close tolerances and fits around the spindle. Misalignment could result in serious damage, high shutdown and repair costs.



*DELICATE LOWERING JOB is performed by operator by activating lever. Each stroke eased shafting .001 in. lower.*

The Hydra-Set is installed as a link between the crane and the load, is entirely self-contained and requires no air or outside hydraulic lines to operate.

Since it functions independently of an OH crane or hoist, it places control in the hands of an operator having close visual contact with the part involved.

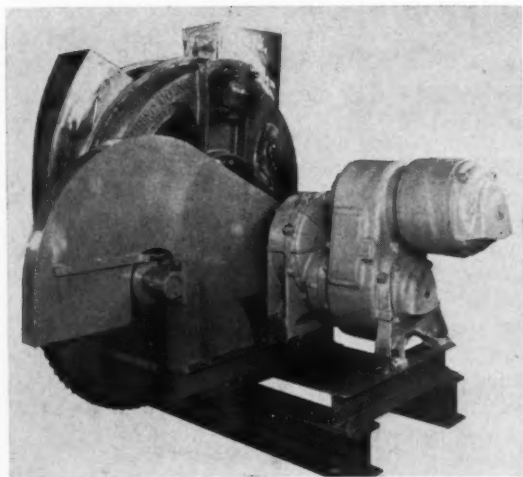


## CAPACITY PRESS LOAD

### gear motor adapts to power need

**M**ANY BY-PRODUCTS must be dehydrated before they can be distributed, consumed or processed. Where there are bulk waters in semi-solid materials, extraction by mechanical means has proved much more economical than extraction by heat.

To aid food and raw material processors, P&L Manufacturing Co., Anaheim, Calif., has built a dewatering



*A 20 HP GEAR MOTOR, right, services this dewatering press of type 1040 steel construction. Gear motor turns press wheels from ½ to 1 RPM.*

press powered by a Sterling Electric Motors Speed-Trol gear motor, supplied by the Los Angeles plant.

The press has been successfully used in processing tomato pomace, citrus peel, potatoes, beet pulp, cherries, corn fiber, fish and fish wastes, paper pulp and cannery wastes.

Depending on capacity of the press, power required has been from 5 hp on the 3-in. press, to 25 hp on the 5-in. press. The Speed-Trol gear motor, when reduced with a chain drive, turns the press wheels from ½ to 1 rpm, and is readily adaptable to capacity loading that the press builder suggests for top operating economy.

According to P&L, the press will operate continuously with practically no maintenance cost other than periodic lubrication. The press operates slowly, working parts are few and Zerk pressure lubrication points are accessible while the press is in motion.

Wet material enters the top of the press from a tank, hopper, or conveyor and falls between large revolving discs, the sides of which are brought together while rotating. Pressure placed on the material caught between extracts the water which is funneled off from the

bottom. Pressed material is discharged continuously at the back of the press.

## VALVES LAST LONGER

### long wearing seats and discs

**A**NY PIECE of equipment must be properly selected, installed, maintained, and operated to give maximum service for minimum expenditure. Maintenance costs keep increasing but installation of the proper valve can produce a considerable saving, not only in maintenance costs but in fewer production losses in lines served by the valve.

Globe valves used on steam lines have always presented maintenance problems, being vital points of the system. It is here that the regulation of steam takes place and where pressure forces and churning action are concentrated. In a short time, depending on temperature, pressure, and frequency of throttling, valve seats will erode, permitting escape and loss of steam, even with the valve closed. The valve must then be taken off the line and repaired.

This costly maintenance problem is being overcome in a General Electric Company plant by using LQ600 bronze globe valves, with patented Brinalloy seats and discs, product of the Lunkenheimer Co., Cincinnati, Ohio. A single bronze globe valve on a steam line in this plant requires opening and closing six times every day. The service is so severe that valves were failing every two weeks, on the average, even when they had case-hardened, stainless steel or stellite-surfaced seats. The maintenance and repair costs, every few weeks, were amounting to double and triple the price of the valves. General Electric then tested a LQ600 valve on the line. They ran the test for more than a year, taking the valve off at 4-month intervals to examine the seat and disc under a microscope. There were no failures, no leakage, and no signs of wear. The valve already has paid for itself more than 50 times over in maintenance savings.

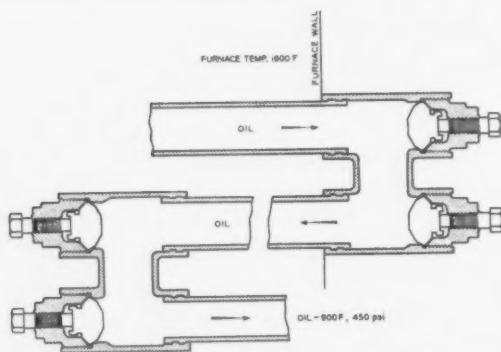
## CAST FITTINGS

### resist furnace corrosion

**O**PERATING IN A punishing corrosive environment, cast stainless header bodies have given years of trouble-free service and solved replacement problems in producing high-octane gasoline at the El Segundo plant of the Standard Oil Company of California. Serving as return bends to control the direction of oil flow through the furnace, these fittings combine the corrosion resistance of stainless alloys with the design advantages of the casting process.

The oils being processed in this plant are usually California crudes, which contain sulfur and other cor-

rodents that cause carbon steel to corrode at a very high rate. Moreover, attack is greatly intensified by the high pressure and temperature at which these fluids are handled—450 psi and 900 F. To resist this severe combination of corrosive conditions, the header bodies were cast of type CF-8 stainless alloy, which contains 18-21 per cent chromium, 8-11 per cent nickel and a maximum of 0.08 per cent carbon.



**COMPLEX DESIGN** cast stainless header bodies serve as return bends to reverse oil flow through petroleum cracking furnace. Holding members can be disassembled to allow removal of coke from oil tubes with a tube reamer.

Oil carried through the furnace tubes is channeled into the U-shaped section of the header, where flow is reversed and returned to the furnace through a lower tube. Tubes are rolled into the header body to produce tight, leak-proof seals.

The header is designed to allow for easy removal of coke which builds up in the headers and oil tubes after extended operation. A tube reamer can be inserted to clean out contaminants after undoing the holding members (bolt, threaded sleeve and plug) assembled into the fitting. The relatively corrosion-free surfaces of the header bodies facilitate this cleaning operation.

## PULSATING BURNER

### cuts fuel, melt time

**A** TEST INSTALLATION of a new pulsating type burner has proved successful at Anaconda Company's Great Falls Montana Plant. The company plans to put the new burner on all of its 700,000-pound reverberatory furnaces there. The new Bliss Pulsating Burner not only cut fuel consumption by 12%, but also reduced the furnace cycle to the desired number of hours.

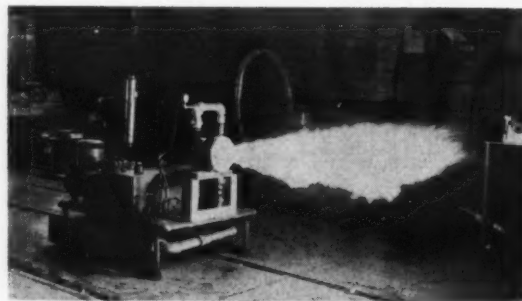
During the test installation of the new Bliss pulsating burner the furnace achieved an all-time record for production during a six-day period. More important,

it achieved this record while cutting fuel consumption by 12% on a per ton basis.

Probably even more important than fuel savings was the fact that the burner reduced the furnace cycle to Anaconda's desired 24 hours. At Anaconda, the second and third shifts are employed to prepare the melt in the 700,000-pound-capacity reverberatory furnace; the first shift does the casting. Any loss in melt time means that the first shift has to sit around waiting for the metal to reach pouring status. The alternative faced by management was to cut the size of the charge to make up lost time. Anaconda suffered either way, being forced to choose between lost man-hours or less output. The Bliss burner ended the problem by delivering full tonnage melts ahead of schedule.

These results are attributed to burner design, which can achieve higher flame temperatures than any other type, attaining 3450° with #6 oil and above 3300° with 1000 BTU/cu. ft. natural gas. Other burners have never been able to achieve flame temperatures above 2900° for gas and 3100° with oil without the addition of oxygen, steam or pre-heated air.

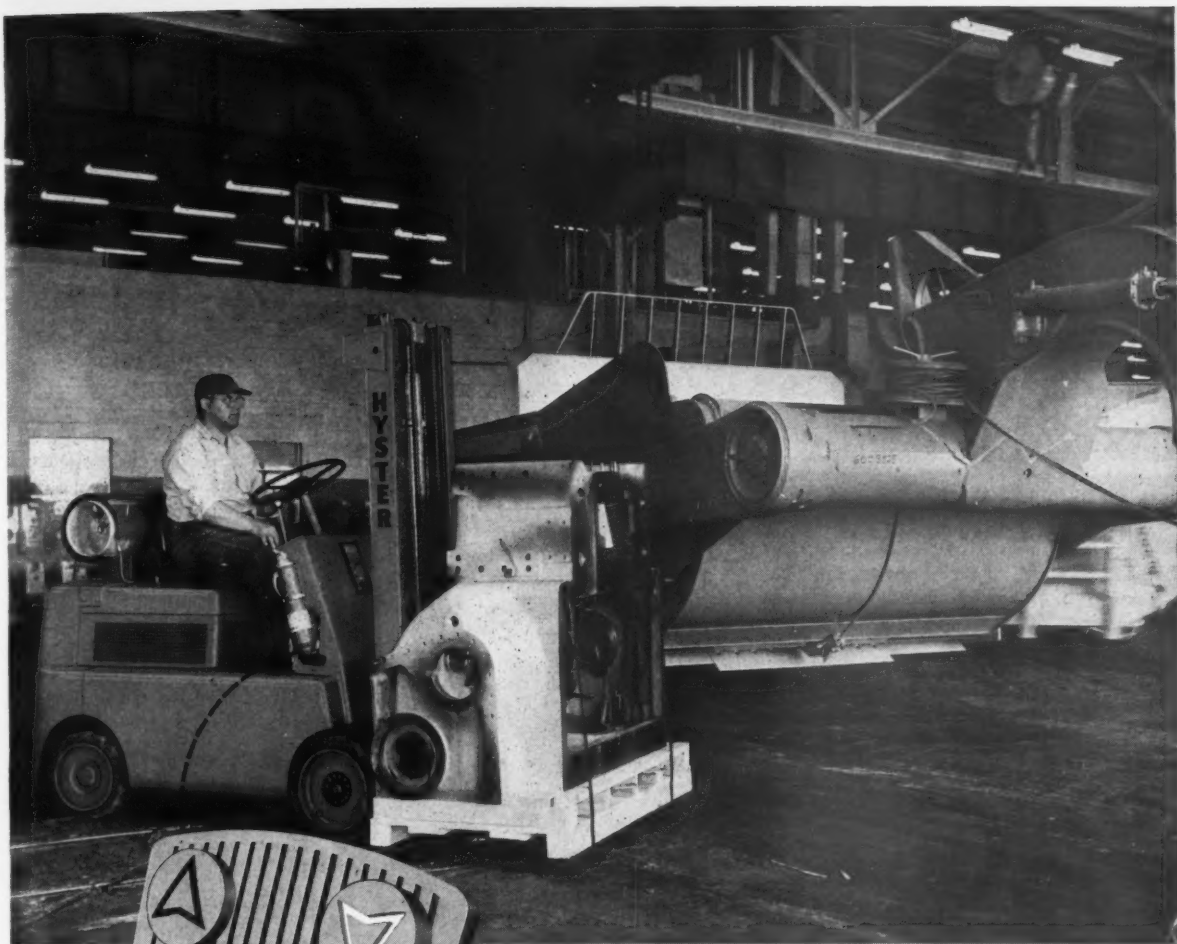
Key to the burner's efficiency is its mixing of fuel and air. A series of small steady "explosions" takes place within the burner. These create extreme high turbulence and result in remarkable combustion efficiency. The velocity near center line of the Bliss Burner is about 600 feet per second compared to 50 for the average burner. The average burner release rate is about one million BTU/cu. ft.; the Bliss Pulsating Burner is more than five times as great—5.5 million BTU/cu. ft., or a little better than that of an average naval boiler.



**NEW PULSATING BURNER** being installed on all reverberatory furnaces in Anaconda Great Falls plant. In tests burner cut fuel consumption by 12% while reducing furnace cycle to desired hours.

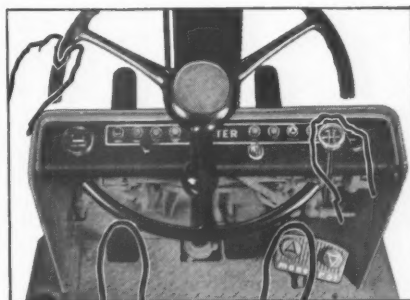
Air for the Bliss installation is supplied from a constant pressure blower at 48 ounces, whereas 90 lbs. plant air is required for present equipment to obtain desired results. The cost of compressing air from 48 ounces to 90 lbs. is saved.

Furnace operation is such that periodic replacement of burners is necessary to maintain production. The Bliss Burners operated continuously through the trial period with no loss of efficiency or deterioration.



## Hyster® Monotrol Trucks improve handling for Caterpillar Tractor Co.

To increase capacity for handling parts and sub-assemblies, Caterpillar Tractor Co. has new Hyster lift trucks with Monotrol control systems on the job at its Joliet, Illinois plant. Two units, 4,000 and 5,000 lbs. capacity, maintain a schedule in shuttling loads between storage areas and production lines. Result: handling operations are faster, driver fatigue is reduced, safety factor improved.



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1169 16th St., Belmont 9-4343

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# HELPFUL LITERATURE

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## RUST CONTROL IN COLOR

"New Color Horizons" is a 38-page treatise on rust and corrosion control by protective coatings. The catalog includes 76 full-color application photos and 110 color chips to show actual colors. It contains a special technical data section on surface preparation, types of surfaces, application techniques, how to estimate gallonage needed for various sizes and shapes, glossary of terms and mixing, thinning and drying data. *Rust-Oleum Corp.*

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## CIRCUIT BREAKERS

A diversified line of molded case circuit breakers is described in 40-page two-color bulletin. Gives ratings, specifications and operating characteristics as a guide to designers, contractors and consulting engineers in selecting breakers for a wide variety of applications. Describes molded case circuit breakers ranging from the smallest, for lighting circuit protection with 100,000-ampere to special purpose breakers. Two-page chart gives ratings, over-current devices, accessories and modifications. *I-T-E Circuit Breaker Co.*

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## CARLOADING CHECK CHARTS

A freight carloading check chart for wall anchored, free floating and controlled floating loads is available as an aid to freight carloading practices. Designed to assist shipping room and loading dock personnel in the proper way to clean, drape strapping and load boxcars, the charts provide clear, simple illustrations on carloading procedures for these type loads. *Signode Steel Strapping Co.*

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## COMPRESSED AIR PRODUCTS

An easy to use color coded, technical catalog coded for the compressed air products industry. It is designed for easy finding of sections covering products for a specific type of application. Pages covering each unit contain complete line photos, functional data, description, explanation of operation, air flow diagrams, specifications and information required for specifying. Also technical information on compressed air for the pneumatic engineer with charts on loss of air pressure, water vapor and CFM. *Wilkinson Corp.*

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## DRILL PRESSES

Photo-illustrated bulletin describing new line of 15-inch drill presses. The two-color brochure covers the 40 bench, production and floor models and the components available for making up special purpose equipment. Primarily production-line tools for metalworking, new machine specifications are included along with catalog listings, motor and motor controls available and dimensional data. *Rockwell Mfg. Co.*

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## DEMINERALIZER BULLETIN

A new line of standardized packaged mixed bed demineralizers designed specially for process water applications is discussed in this bulletin. The publication contains information on the use of demineralization process eliminating variables in water and their effects on product quality control. Demineralization water uses, specifications chart and illustration, capacity, installation and utilities required are covered in the brochure. *Cochrane Corp.*

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## PAINTING GALVANIZED STEEL

The most effective techniques for painting galvanized steel sheets, based on years of research and experience, are explained in a new 15-page booklet. Contents cover description of galvanized steel sheets, inhibitive coatings, painting for appearance, painting for heat reflection, painting for longer life, selection of paints, application and special instructions. *Committee on Galvanized Steel Research of American Iron and Steel Institute.*

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## TUBE FORMING BROCHURE

A new aircraft engineering bulletin covering engineering data and other important information of the fabrication of tight bend tubes. The illustrated brochure describes how the bends are formed through a cold process method to extremely short radius bends of 1 to 1 ratio, or less, and controlled wall thickness. Aluminum, steel, stainless steel and other alloys are discussed along with charts showing sizes from 1/4 in. to 3-in. tubes available. *Aeroquip Corp.*

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## REVISED DESIGNER'S GUIDE


Recent revisions in the Standard American Welding Society Symbols have been included in Designer's Guide for Welded Construction to bring this bulletin up to date. The guide contains charts and illustrations providing information on the application of welding symbols and other basic design data on welds. Useful for quick reference with specification tables on different types of electrodes and suggestions for planning better welded designs. *Lincoln Electric Co.*

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**...in hard-to-reach places**

## **NEW Airco Automatic Heliweld Head**

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The new Airco Automatic Heliweld Head is right at home on the toughest jobs. Internal circumferential seams, for example, are handled

easily with the 3" or 12" offset arms. Tilting mechanism provides accurate, controlled welding through 360°.

**Take your choice of two models.** Model E takes electrodes up to 24". Model D takes electrodes to 7", and is provided with rotatable offset arms of 3" and 12", greatly increasing your ability to weld hard-to-reach spots.

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and Slings • CF&I-Wickwire Wire • Wick-  
wire Springs and Formed Wires

#### AIR PROCESSING EQUIPMENT

Bulletin includes data on such equipment as ovens, dryers, air heaters and curing systems for use in such industries as pulp, and paper, paint finishing, rubber and foam rubber, foundries, plastics and chemical processing. Six specific case histories cover tough drying or curing problems solved by properly engineered equipment. Contains photos and diagrams. *J. O. Ross Engineering, Div. of Midland-Ross Corp.*

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#### SCREW MACHINE DATA

A 120-page manual "Screw Machine Stock... Estimating and Operating Data" covers the properties, specifications, estimating information and shop practices for machining aluminum. The book charts such varied production and estimating problems as machining feeds and speeds, hourly production rates, weights of rounds and hexagonals, weights of segments of spheres, weights of truncated cones and circular segments, limiting dimensions, tolerances for drilled holes, defects and their causes and government and aeronautical material specifications. *Aluminum Co. of America.*

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#### MACHINE SHOP ACCESSORIES

New catalog lists arbors, adapters, collets and other machine shop accessories. The important features and characteristics of the product are listed compactly so that the materials, limits and other features can be absorbed at a glance. Index of the 45-page catalog is illustrated so that the user can quickly determine the product he is seeking. *Brown & Sharpe Mfg. Co.*

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#### HIGH ALLOY CASTINGS

Static, centrifugal and shell castings are discussed in this 20-page bulletin. In color and illustrated, this handy guide to the selection and use of high alloy castings includes technical data table on physical properties for corrosion, heat and abrasion resistant alloys plus standard designation and stress temperature curves for selected high alloys. *Duraloy Co.*

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... for more details, circle No. 20 on Reader Service Postcard

## HYDRAULIC SHEARS

Bulletin describing hydraulic shears which range in capacity from 8 ft. of  $\frac{3}{8}$  in. mild steel to 12 ft. of  $1\frac{1}{2}$  in. mild steel. Folder shows typical models and presents detailed table of specifications for all models. Also included are descriptions and illustrations of features of design and construction. *Verson Allsteel Press Co.*

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## MACHINING SERVICE

Well illustrated brochure shows all the machining services available from one large organization. Included are screw machine work, turret lathe operations, threading, grinding, assembly, prototype work, etc. Index gives complete machine facilities available. Brochure has particular interest to firms desiring to increase their scope by using an outside facility. *Screw Products Corporation of America.*

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## AIR-SEAL VALVES

Eighty-page catalog of air-seal valves includes listing of manual and foot operated valves, solenoid-pilot operated valves and direct-solenoid operated valves. Data on characteristics and dimensions is presented in chart form along with diagramed drawings and photographs. This comprehensive publication answers engineering, maintenance and purchasing needs. *Barksdale Valves*

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## POROUS METAL FILTRATION

Brochure covering technical information on porous metal for filtration and non-filtration applications. Two-color, the booklet details the capabilities and typical examples of wound wire porous metal with photos, drawings and curves. Descriptive examples include stainless steel and super alloy Poroloy and Poroloy CS which is made from low alloy and carbon steels. Technical data is presented in the form of specifications and curves for flow rate and physical characteristics. *Bendix Aviation Corp., Filter Div.*

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WESTERN INDUSTRY/JANUARY 1960

## This PAYLOADER<sup>®</sup> improved



## a paper-maker's handling system

Simpson Paper Co., Division of Simpson-Lee Co., is pleased with the new method of handling old magazines, newspapers and other materials at its Lowell, Wash. plant. After six months of experience with the Model H-25 "PAYLOADER" it reports several ways this tractor-shovel saves them time and money:

- 1 Feeds magazines and papers from stockpiles to a conveyor at a substantial saving in manhours.
- 2 Handles bundled or scattered papers with equal ease.
- 3 Doubles the holding capacity of the storage rooms by piling materials high throughout the storage area.
- 4 Rides the regular elevator for quick transfer to any floor.

**ADAPTABLE**—Only one man is required to operate a "PAYLOADER" and, without special or expensive installations, it works indoors or outdoors, on paved or unpaved surfaces with equal efficiency to handle all kinds of bulk materials.

**ATTACHMENTS** that interchange quickly with the bucket broaden "PAYLOADER" usefulness: Lift Forks for pallets, barrels, drums, bales; Hydraulic Grab for tangled scrap, coils, and the like; Pick-up Sweeper for aisles, floors, parking areas.

**MECHANICAL FEATURES**—Speed, capacity, maneuverability and ease of operation are combined in the H-25 for big production all day long—thanks to 2,500-lb. operating capacity, power-shift transmission, torque converter drive, power-steering, power-transfer differential and fast, powerful hydraulic bucket control.

**A HOUGH DISTRIBUTOR** is nearby to show you how a Model H-25 or a larger "PAYLOADER" can help cut your bulk-handling costs.

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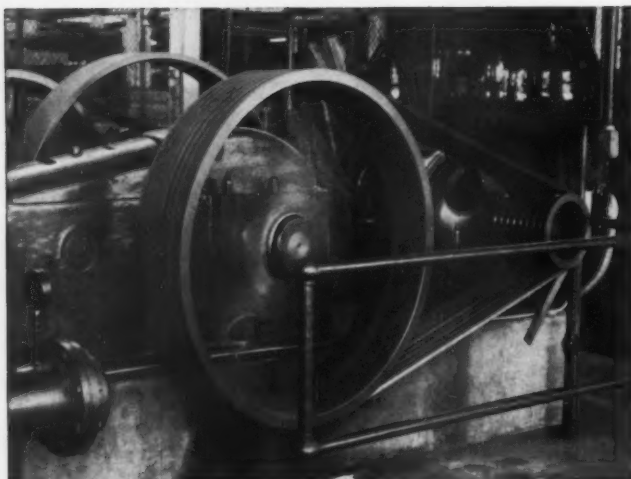
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### WELDING EQUIPMENT

A new 20-page catalog shows the Heliarc line of manual welding equipment. Every torch is clearly illustrated in one-half actual size and the accessories available for each torch are described and listed separately in handy table form. Weldable metals include titanium, nickel, silicon-bronze, magnesium, aluminum and galvanized steel. *Linde Co., Div. of Union Carbide.*

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### BOILER GASKET LEAKAGE

Some Causes of Boiler Gasket Leakage is the title of a technical paper in which some little-known facts are reported in an effort to help minimize a common and annoying problem. Illustrated with photographs, the paper discusses the gasket joint, correct installation and corrosion as related to causes of boiler gasket leakage. *Betz Laboratories, Inc.*

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### CONTROL CABLES

This condensed folder catalog outlines and describes certified control cable available. There is a table showing the most frequently ordered sizes and the number of conductors as well as a listing of the materials and elements to which the neoprene jacketed cables are resistant. *Western Insulated Wire Co.*

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### DIVERSIFIED PRODUCTS

Listing of highly diversified products in this catalog includes asbestos products, ventilating equipment, electrical products, forgings and fittings, friction materials, non ferrous metals, refractories, rubber and synthetics, steels, tools, wire rope and strand. Catalog also lists plant and sales office locations. *H. K. Porter & Co.*

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### OVERHEAD CONDUCTORS

The Saffowbar conductor systems for providing electrification on overhead materials handling equipment is described in this bulletin. Illustrated and diagrammed, the folder discusses uses, design, installation, safety and maintenance. *Cleveland Tramrail*

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WESTERN INDUSTRY/JANUARY 1960



### VERTICAL 4-SLIDE MACHINE

Detailed operating features and specifications for the new Vertical Four-Slide Machine are given in this technical bulletin. Components include cam timing disc, center form, slide feed assembly, toggle-type press and forming slides. Specifications cover machinery capacity, drives, slide strokes, press, feed and other data required in evaluating application of the machine. *Torrington Mfg.*

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### MAINTAINED-CONTACT SWITCHES

Data sheet describes two new oil-tight maintained-contact yoke-actuator switches. The plug-in feature of the switch is outlined along with operating detail and the brochure includes photographs, dimension drawings, characteristics and electrical ratings. *Minneapolis-Honeywell Regulator Co., Micro Switch Div.*

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### ELIMINATE STORAGE PROBLEMS

Photographs of material storage rack installations are reproduced in this brochure. Space and labor saving prefabricated storage racks for tools and dies, building materials, furniture and auto body trim materials are illustrated in the bulletin. *Storage Products Corp.*

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### INSULATORS FOR TUBING

High Purity Insulators for Sheathed Thermocouples is the title of a new bulletin. It describes the uses and technical specifications of fused magnesium oxide, aluminum oxide and Zirconia thermocouple tubing used in connection with aircraft turbines, atomic reactors and other situations where accurate temperature measurement is important. *Norton Co.*

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### OXYGEN STEELMAKING

An attractive illustrated booklet telling the story of oxygen steelmaking at its Fontana, California plant has been prepared by Kaiser. The book describes how the steel is made in minutes instead of hours, how the Fontana oxygen steelmaking furnaces are designed, constructed and operated as well as the quality of the basic oxygen steel. *Kaiser Steel Corp.*

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WESTERN INDUSTRY/JANUARY 1960

# BRODHEAD

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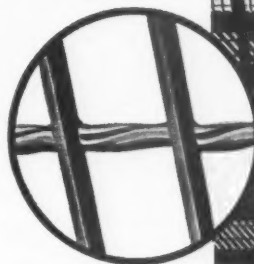
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## GAS WELDING RODS

Well-documented, this bulletin gives full information about gas welding rods, analysis of the rod, recommended uses, welding procedure and physical properties. The rods are designed for welding practically all fabricating ferrous metals. Information and data are also presented regarding the oxy-acetylene flame, torch tip sizes, pipe welding, weights of rods and weld metal deposits as well as cost factors. *Page Steel & Wire Div., American Chain & Cable Co., Inc.*

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## BASE METAL AND ALLOY BRAZING

Descriptive brochure outlining facilities and services of specialized engineering staff in the field of joining of aircraft, rocket and missile components for service where unusual resistance to corrosion and high temperature is required. Illustrated and in color, the advantages of using pure dry hydrogen and nickel alloy for brazing are discussed and pictorial examples are given. *Western Alloy Engineering Co., Inc.*

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## MACHINING THERMOPLASTICS

How to work plastics is outlined in the photo illustrated bulletin, "Machining Thermoplastics." This well organized pamphlet gives both general and specific recommendations on machining and finishing of thermoplastic sheets, rods and tubes. The booklet discusses sawing, routers, drilling, turning, threading, tapping, shearing, blanking, punching as well as finishing. *Cadillac Plastic and Chemical Co.*

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## RELIEVING STRESSES

The use of portable 400-cycle induction heading equipment for stress relieving welded joints is described and illustrated in this new folder. The pamphlet explains the principle of high frequency induction heating and answers many questions about its use for stress relieving welded joints. Several unusual stress relieving jobs are illustrated and described. *Hobart Brothers Co.*

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## VIBRATING COOLERS & DRYERS

Comprehensive book covers electric and mechanical vibrating type coolers and dryers of both the direct and indirect type. The 32-page book includes sections on basic drying principles, also auxiliary equipment in the vibrating line such as feeders, conveyors, magnetic separators, packers, controls and constant weight feeder. A pilot unit rental system is outlined. Drawings, photos and specifications as well as material weight charts are included. *Jeffrey Mfg. Co.*

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## CONTROL CATALOG

New, 72 pages, illustrated, covering complete product description of motor starters both manual and magnetic, contactors, relays, solenoids, limit switches, push buttons, static control and pilot devices. Features, wiring diagrams, dimensions and application information for each device are included and horsepower selection charts are listed for motors from one-fourth through 200 horsepower. *General Electric Co.*

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## HEAT EXCHANGERS

Illustrated bulletin on impervious graphite immersion heat exchangers and circulating steam jets for heating or cooling corrosive solutions in all types of tanks. Sections on plate, bayonet and coil type immersion heat exchangers cover general descriptive, installation and operation information. Dimensioned sketches on each type give complete construction details and tables on weights and effective surface areas. *National Carbon Co.*

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## ALLOY TUBING STEELS

Two general purpose steels which lend themselves to standardization for various tubing applications is the subject of a folder "Matching Tubes to Jobs with 4340 and 4620 Seamless Mechanical Tubing." General characteristics and technical data covering these two grades, including a discussion of critical points, effect of alloy elements, carburizing and relative machinability are found in this publication. *Babcock & Wilcox*

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# AGAIN-



## Revere helps "fit the metal to the job"

**AND A MAKER OF MEDICINE CABINET  
MIRROR FRAMES SAVES \$10,000 A YEAR**

As a result of a suggestion made by one of Revere's Technical Advisors, a maker of mirror frames for medicine cabinets has saved \$10,000 a year on polishing costs alone. The suggestion was that, by changing to a brass of different grain size, the manufacturer might be able to save money on polishing costs and at the same time improve the quality of his product. (The 90° bend to which the mirror frames are subjected also had to be taken into consideration.)

Samples were made using a Revere Brass Strip with a smaller grain size as recommended by the Technical Advisor. Tests showed that, as a result of the change the manufacturer was able to realize a saving of 17¢ per mirror frame on polishing costs alone, with no increased costs in other operations, including the 90° bend. Based on the saving per frame this manufacturer has saved \$10,000 per year for the past 4 years!

Here is still another example of how Revere's Technical Advisory Service working with the customer and the mill helped "fit the metal to the job," thus saving the customer money as well as improving product quality.

Why don't you take advantage of the extensive knowledge of Revere's Technical Advisory Service in "fitting the metal to the job?" It's entirely possible this service can save you money . . . help improve the quality of *your* product.



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## SPIRAL CONVEYORS

Engineering data, conveyor layouts, capacity tables and selection and horsepower requirements are presented in this 56-page catalog about spiral conveyors. Many photos, drawings and tables are used throughout the comprehensive book which has sections on couplings and shaftings, hangers, trough ends, etc. Conveyor specification is detailed. *Jeffrey Manufacturing Co.*

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## FOAM MAKING TECHNIQUES

Blowing urethane foams with fluorinated hydrocarbons is presented in a new publication "Blowing Foams with Isotron." In addition to a chart comparing the physical properties of the most widely used insulating and cushioning materials, technical data on Isotron is included. The brochure discusses the advantages of the new foam making technique and some of the growing uses for urethane foams. *Pennsalt Chemicals Corp.*

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## HAMMERMILLS

Illustrations of the installation and operation of the industrial hammer-mill are shown in this new bulletin. Photos show different types of materials being crushed, ground, shredded or pulverized. Pamphlet includes capacity charts and specifications, diagrams and detailed descriptions of the crushing elements, components, parts and accessories. *Gruendler Crusher & Pulverizer Co.*

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## ZIEGLER STEEL

*—a whole company ready  
to solve your problems*

**First the salesman.** He's schooled in a Ziegler warehouse, brought up through Inside Sales, and experienced in the field. He's ready to help you.

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**There's Ziegler management**—if salesmen don't find the answers, the sales manager, and even the company president will pitch in. There's always a tremendous fund of know-how available to you at Ziegler, for use when you need it.



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## PRECISION SWITCHES, RELAYS

New catalog of precision built switches, relays and gravity sensing potentiometers includes detailed, actual size illustrations and technical information. Typical applications for each item is shown along with diagrams covering many types of actuating mechanisms for operational usage, their sizes and prices. *Hamlin, Inc.*

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## GEARBELT DRIVES

A new 56-page catalog gives specifications on hundreds of stock items of gearbelts and gearbelt pulleys. Featuring a new line, this catalog contains extensive design and installation suggestions, engineering data and examples along with tables of hundreds of practical stock drive combinations already worked out for convenient selection. *Browning Mfg. Co.*

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## ELECTRODE SELECTION

A handy pocket guide containing 70 pages of technical information on electrode properties on different types of electrodes, their specifications, calculating consumption, electrode reconditioning and recommended electrodes for various steels. Large, easy to read charts and thumb index guide make this pamphlet a useful pocket manual for engineers. *Air Reduction Sales Co.*

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## INSTRUMENT COMPONENTS

Pocket-size, this 416-page catalog contains technical details, MIL specifications and complete drawing of over 12,000 stock items. Included in this handy catalog are gears, shafts, speed reducers, magnetic clutches, differentials, instrument plates, tool parts and other associated components. *PIC Design Corp., Subsidiary of Benrus Watch Co.*

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## SILICON CARBIDE ELEMENTS

Technical information is included in this illustrated brochure describing a major advance in silicon carbide electric furnace heating elements. Discusses advantages of new heating elements for high temperature furnaces at all element temperatures up to 1575 deg. C. (2867 deg. F.). Charts show wattage loading and resistance versus temperature. *Morganite Inc.*

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## BLOCK AND BLEED VALVES

The new block and bleed feature of pipe valves is described in this 10-page brochure. The absolute shut-off and visual shut-off tests, safety, operational features and recommended services are outlined. Sizes, materials and combinations of materials are also included in the catalog in charted detail along with corrosion data tables. *Pacific Valves, Inc.*

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## SILICON ZENER DIODES

A complete line of hermetically sealed silicon zener diodes is described in this new brochure. Tables list 152 standard types and instructions on selection from 1584 standard and special voltage tolerance types. Also detailed are zener diode performance characteristics, current limits and derating curves covering the units listed. *International Rectifier Corp.*

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## MOTOR AND IN-LINE REDUCERS

New catalog deals with vertical motor reducers for use with equipment such as blowers, compressors, conveyors, cranes, hoists, elevators, machine tools, rotary mills, mixers and stokers. Describes construction and mechanical features of motor reducers in eight housing sizes for applications up to 125 hp and output speeds of 9 rpm to 420 rpm. Load characteristics are outlined, including horsepower and torque ratings, overhung loads and maximum allowable thrust loads. Complete mounting dimensions and parts lists for each type of reducer listed. *Philadelphia Gear Corp.*

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FROM 1/4 HORSEPOWER

TO

# 1000 HORSEPOWER

Average Tensile Strength 95,000 lbs.

ACTUAL SIZE NO. 25, 1/4" PITCH



Average Tensile Strength of 925 lbs.



ACTUAL SIZE NO. 200  
2 1/2" PITCH

ACME Roller Chain applications range from fractional horsepower drives to those in excess of a thousand horsepower.

The ACME 1/4" pitch roller chain, weighing less than two ounces per foot, is used on such intricate machines as microfilm projectors, electronic controls

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Use ACME Roller Chain Drives and be assured of these inherent characteristics:

- 1 High efficiency throughout the life of drive.
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- 6 Large speed ratios — up to, and including 6 to 1.

Your local Distributor can supply you promptly with ACME Roller Chains in 12 standard sizes, from 1/4" pitch, 1/8" width to 2 1/2" pitch, 1 1/2" width.



Write Dept. 2-V for new 100-page illustrated technical catalog including new engineering section showing 36 methods of chain adjustments.



COMPLETE LINE OF ROLLER CHAINS AND SPROCKETS • DOUBLE PITCH CONVEYOR CHAINS • STAINLESS STEEL CHAINS • CABLE CHAINS • FLEXIBLE COUPLINGS • STANDARD AND SPECIAL ATTACHMENTS

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## SPECIAL MANUALS

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### PUMPS

#### HANDY PUMP MANUAL

Thumb-indexed, this manual provides information about a rotary mechanical positive displacement type pump and an open impeller type centrifugal pump. These two basic type lines are fully described, together with complete ratings, performances and various applications of each. The rotary type pump ratings are based on handling lubricating oil at a viscosity equal to No. 10 S.A.E. while the open impeller type ratings are based on handling clear water at 60 deg. F. *Dura Corp.*

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#### AIR AND VACUUM PUMPS

A high vacuum pump that is able to produce vacuums to 29.9 in. Hg. without the necessity of water cooling is described in this catalog. A table shows performance curve, dimensions in inches and specifications for fan cooled and radiator cooled pumps. Also, covered in the catalog is a description of the 4-wing type and 2-wing type air and vacuum pumps, integral air and vacuum pumps, air motors, gas boosters and accessories. *Leiman Bros., Inc.*

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#### HIGH VACUUM PUMPS

The vacuum pump and its application is covered in this 44-page illustrated catalog. Types of vacuum systems, selection and tabulated data are included. There is a discussion of the operating mechanism, vibration elimination and descriptions of the single stage pumps, compound pumps and the two-stage mechanical booster pumps, along with specifications and pumping speed curves. Also, conversion tables and vacuum formulae. *Kinney Mfg. Div., New York Air Brake Co.*

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#### PUMPING MANUAL

Twenty-four page comprehensive manual covering pumps for every industrial use. Includes tables showing cost of operating pumps, motor data, displacement per stroke in gallons for various diameter plungers, capacities of cylinders of various diameters and lengths, theoretical horsepower required to raise water to different heights, capacity of round and square tanks, friction loss of water, viscosity of liquids and materials for pumping various liquids. Three pages are devoted to general information. *Pacific Pumping Co.*

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#### SEAL-LESS PUMPS

Two-color bulletin describing complete line of seal-less pumps for leak-proof pumping. Brochure covers design and operation of pump as well as specification data and selection. The latter is based on total dynamic head, flow rates desired and the physical and chemical characteristics of the fluid pumped. *Chempump Div., Fostoria Corp.*

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#### INDUSTRIAL PUMPS

Built to meet the demands of high production machinery, a line of machine tool coolant pumps is the subject of this illustrated catalog. Contents include general description and instructions, immersed type pumps, the long immersed type, pipe connected, performance curves, flange mounted external and internal discharge, motor base brackets, mounting brackets and tanks. *Ruthman Machinery Co.*

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#### ROTARY VACUUM PUMP

Brochure describes sliding vane type pump with rotor shaft running in precision needle bearings lubricated by special designed oiler. Furnished as a standard unit, three different types of mountings are illustrated in the bulletin along with technical data. Industrial uses include packaging machinery, test chamber evacuation, lab equipment, plastics forming machinery, vacuum checks and many others. *OrVac Div. of Industrial Gages, Inc.*

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#### CENTRIFUGAL PUMPS

Brochure describes centrifugal pumps built only from corrosion and erosion resistant alloys and designed for the toughest applications. Includes table of comparative corrosion rates, average values, composite head capacity and efficiency curve. Also, materials of construction and parts interchangeability chart and typical analysis and specifications for materials of construction chart. *Ampco Metal, Inc.*

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#### NEW MULTI-PURPOSE PUMP

Bulletin describing a new pump line and suggesting new ideas for multi-purpose applications. Nodular construction, variable flow and variable viscosity as well as blending and proportioning are new features of this pump line discussed in this comprehensive bulletin. A short cut in blending made possible through new design is described. Contains photos, diagrams and tables giving application data and viscosity GPM curves. *Blackmer Pump Co.*

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56

#### AXIAL PISTON TYPE PUMPS

Illustrated three-color catalog giving complete data on the axial piston pumps and how they work. Under headings of constant volume and variable volume, typical performance data is presented in table form and there is a discussion of controls for the variable volume pumps. Also covered in the catalog is a description of the vane type pumps and typical performance data. *Denison Engineering Div., American Brake Shoe Co.*

... FOR YOUR COPY, CIRCLE NO. 215

#### ROTARY GEAR PUMP

Illustrated brochure explains design features of line of rotary gear pumps. Detailed tables give dimensions, capacities in gallons per minute from 1/4 to 146 GPM, horsepower ratings, pressures up to 2000 psi and revolutions per minute. Discusses the semi-custom design through the use of interchangeable pump sections and materials to meet the needs of intended use and points out many of the hundreds of applications where these pumps are used. *Northern Ordnance Inc.*

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#### ALLOY PUMPS

The positive displacement principle and how it works in the pumping of liquid is discussed and illustrated in this brochure. A table shows correct pump materials suitable for certain liquids. Also discusses alloy pumps for successful handling of many corrosive liquids or those requiring metals to eliminate contamination. Technical data on available pump sizes, alloys and operating conditions are included. *Viking*

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#### METERING PUMP

Complete details on an all pneumatic pump for metering or proportioning are given in this bulletin. The brochure describes operating principles of the pump and its controller, which has a pump-plunger-positioning accuracy within 0.002 inch, repeatedly. Also included are five typical applications which are fully explained in terms of suggestions for similar uses. Design data listed include maximum capacity, operating characteristics, stroking rate, materials of construction, and actuating power requirements. *Associated Control Equipment, Inc.*

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#### VACUUM HIGH-SPEED PUMP

Booklet tells the story of putting vacuum to work, applying the Roots principle, and operation and features including the high rotation speed so that extraordinarily high pumping speeds can be obtained with comparatively small external pump dimensions. Other features covered include high speeds and throughput, oilless pump chamber, elimination of valves and by-pass lines, internal drive, mains adapter, pressure switch and compact size. Speed curve charts are included as well as operating characteristics. *Consolidated Vacuum Corp., subsidiary of Consolidated Electrodynamics Corp.*

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WESTERN INDUSTRY/JANUARY 1960



## INTERNAL, EXTERNAL BEARING TYPE PUMPS

Recommended uses are outlined in bulletin describing pumps of the internal bearing and external bearing type. Selection data is discussed and tables show gallons per minute and approximate dimensions of the two types of pumps. Diagramed drawings show cross sections of the two types. The internal bearing type pump is designed for oils and other lubricating liquid services while the external bearing type is recommended for pumping non-lubricating liquids such as acids, asphalts and solvents. *Sier-Bath Gear & Pump Co., Inc.*

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## DRUM PUMPS

Air operated drum pumps, heavy duty pumps, standard duty drum pumps, drum pumps for transferring oils and greases, fluid oil pumps for tank installations, gear spray pumps, measuring and electric high pressure pumps are covered in this three color catalog. Containing diagrams and illustrations as well as descriptions, the catalog also includes data on pump and drum accessories. *Alemite Div., Stewart-Warner*

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## BOILER FEED PUMPS

Attractively illustrated booklet about the high pressure boiler feed pumps, type BFI. Covers service ratings (capacities to 6000 USGPM), background, general description, radial and axial balance, design and construction, including the case, head, impellers, diffusers, optional hydraulic shaft seals, bearings and the pressure lubricating system. The booklet shows how the pump is made, designed, inspection and test. *Pacific Pumps*

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## CHEMICAL PROCESS PUMPS

Design and construction features of DL and DM chemical process service pumps are outlined in this brochure. The DL type is designed for virtually all liquids used in the chemical process and oil refining industries with a capacity to 1000 gpm., temperature limit to 250 deg. F. while the DM type has a temperature limit to 450 deg. F. Both are single stage, single suction, horizontal centrifugal pumps with vertically split case. Performance charts are included in the brochure. *Peerless Pump Div., Food Machinery and Chemical Corp.*

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## HEAVY DUTY METERING PUMP

Complete performance data is included in catalog about new metering pump line with a wide range of capacities, from 0.65 to 2025 gph. The pump is electrically driven and is of the positive displacement, reciprocating plunger type. With a metering accuracy within 1%, plus or minus, the standard model operates against pressures up to 4000 psi. Describes the pump drive which was designed to function with one, two, or three liquid ends, giving increased capacity and discusses the Simplex, Duplex or Triplex units which may be coupled to the same drive shaft for blending two or more liquids. *Wallace & Tiernan Inc.*

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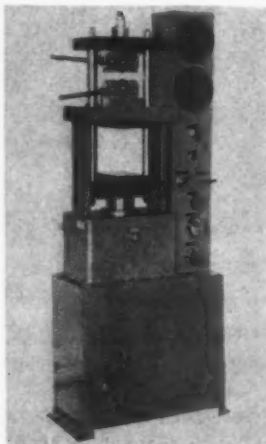


USE RIP OUT POSTCARD, PAGE 53, FOR MORE INFORMATION ON PRODUCTS DESCRIBED

## PHI TENSILE AND COMPRESSION TESTER

... designed for user in the 20-ton range

Specifications, in addition to the 20-ton capacity, are an 8-in. stroke and a motorized hydraulic system with full speed control for both closing and pressure, and large intermediate and maximum pressure gauges. The 8-in. sq. crushing plates and tensile grip jaws are hardened and arranged for quick and easy release of the test specimens, designed so that there is a positive straight line pull. Frame of the tester is all-steel welded; the hydraulic system is contained in a steel paneled stand beneath the machine and controls are convenient-



ly located. *Pasadena Hydraulic.*

... FOR MORE DETAILS, CIRCLE NO. 231

## NICKEL PROCESS

... produces bright, smooth, uniform coating

A new bright nickel process, Superlume, yields deposits which are exceptionally bright at high and low current density areas and has the ability to level-out scratches to an extraordinary degree. The process is also characterized by an excellent tolerance to inorganic purities such as zinc and copper and the bath is amenable to continuous carbon treatment resulting in relative freedom from organic contamination. *Hanson-Van Winkle-Munning Co.*

... FOR MORE DETAILS, CIRCLE NO. 232

## AIR HOIST

... wide lifting capacity range, adaptable usages

Air-powered, this hoist offers a choice of several throttle and brake systems that make it adaptable for use in such divergent areas as mine shafts for hoisting men and materials, car spotting at industrial plants and many others. The lifting capacity ranges from 27,000 lb. at 37 fpm. to 3,700 lb. at 220 fpm. A five cylinder, radial air motor (10, 17 or 23 hp.) with integral gear case drives the large rope drum through a multiple roller chain. The rope drum has a capacity of 2,300 ft. or 3/4-in. wire rope. For portability the hoist is mounted on a one-piece skid type welded steel base. Controls for the hoist are mounted in the standard model but can be removed and operated from a remote position. *Joy Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 233

## HIGH-SPEED TAP TOOL

... makes simple job of tapping 0-80 holes in steel

This new super sensitive high speed tap tool features finger tip control head for precision tapping 0-80 to 4-40 holes in steel. Control of the tapping operation is through the knurled collar just above the top. Held lightly in hand, a slight downward pressure applied to the collar drives the tap into the work and a light upward pressure reverses it. During the tapping operation the tap can be cleared as necessary by the rapid reverse control, the head is readily adaptable for through or bottom tapped holes. *Armit Laboratories.*

... FOR MORE DETAILS, CIRCLE NO. 234

## POSITIVE PRESSURE FUEL SYSTEM

... for forklifts, farm tractors and industrial engines

An entirely new concept in LP-Gas carburetion consists of a carburetor and converter. This true positive pressure system injects vaporized fuel into the engine air stream under pressure which is controlled by the engine manifold vacuum. The idle and power are the only adjustments in the entire fuel system. The forklift model carburetors have a built-in vacuum switch. The small 4 in. converter may be mounted in any position to facilitate installation and the pressure system eliminates the need for a primer or choke mechanism for starting. *American Liquid Gas Corp.*

... FOR MORE DETAILS, CIRCLE NO. 235

## VINYL COLOR-NUMBER MARKERS

... make for easy, standardized lubrication system

An economical method to insure regular and correct lubrication of machinery and equipment is made possible by the use of self-sticking lube labels to identify lubrication points, tell the types of lubricant to use as well as indicate frequency of lubrication. This new system saves labor and supervision time. It also assures proper lubrication, saves equipment failure, repair and replacement plus production line down time. The labels are made from tough, self-sticking vinyl material, and are highly re-



sistant to oil, grease and abrasion. Stocked in five bright, fadeproof colors, and numbered 0 through 9 in a 5/8-in. diameter die-cut circle, the color-number combinations give lubrication engineers 50 codes to identify different greases, oils and fluids. *W. H. Brady Co.*

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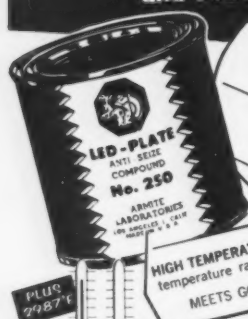
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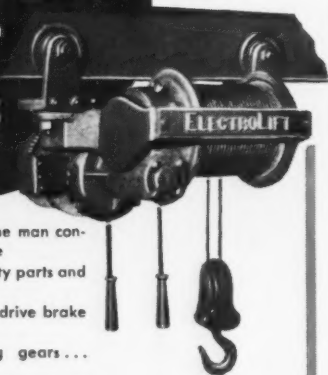
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Electrolift worm-drive hoists give you smooth, fast control over loads of from 1/4 to 10 tons. For details on speeds and models, consult your Electrolift representative, listed in the classified directory.

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**PLASTIC PUTTY**

...for trimming edges of light-weight sandwich structures

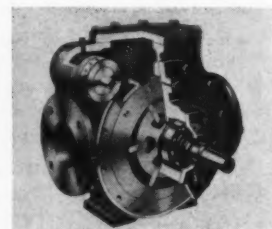
This thixotropic plastic putty, which cures at room temperature into a solid chunk of epoxy resin, provides a rigid, structurally strong edge for fastening the sandwich in honeycomb sandwich structures. Holes drilled through the plastic provide firm points of contact; load is transmitted through the plastic edge and into the structure itself. Once applied, it will not sag out of place, even if sandwich is held on edge. *Narmco Resins & Coating Co.*

... FOR MORE DETAILS, CIRCLE NO. 237

**PUMP LINE**

...with new flow control concept

A new line of pumps that bring a different and economical concept to control of liquid flow and to proportioning has been developed. Known as the Vari-Flo line, these pumps are of the highly-efficient vane-type with a simple means for changing displacement to vary delivery from zero to full capacity while running at constant speed. This eliminates the need for expensive variable speed drives. Variations in flow are controlled instantly by a graduated dial which can be turned manually or automatically, with a variety of optional arrangements for special applications.



Without changing rotation or speed, the pump can reverse its flow to evacuate discharge lines after shut off. In blending applications, units can be combined with standard components to provide a relatively simple system that will produce any desired blend ratio of base stocks. *Blackmer Pump Co.*

... FOR MORE DETAILS, CIRCLE NO. 238

**MOLDED PLASTIC ASSEMBLY BIN**

...for electrical and electronic product manufacturers

Lightweight, easy-to-handle, high impact molded plastic assembly bin specially designed for small parts assembly. Assets include no magnetic interference, good thermal insulation, high resistance to abrasion and no corrosion of paint to contaminate materials. Individual bins can be stacked, tapered fronts permitting convenient semicircle set-up and sloping bottoms provide natural forward flow of parts. Bins offer complete flexibility to suit changing requirements. *Stackbin Corp.*

... FOR MORE DETAILS, CIRCLE NO. 239

**CAR PULLER**

... totally enclosed, fully protecting operator from moving parts

Greater safety for operating personnel is provided with this wire rope car puller, which brings the power of a locomotive to one-man car spotting jobs. A heavy duty clutch operated by a hand wheel permits drum to be released and turn freely in paying out rope; clutch is easily engaged to start and pull a rated load; operator does not have to maintain tension or coil rope. *Stephens-Adamson Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 240



#### TEMPERATURE INDICATORS

... available in stick, pellet and liquid form

Developed for the metalworking industry and other fields where heat is used, this precision temperature indicator tells the metallurgist, engineer and metalworker when a surface has reached a specific temperature. Available in the three forms, Thermomelt is provided in a wide choice of Fahrenheit ratings from 113 deg. to 2000 deg. Use of this indicator is simple. When the surface reaches the wanted temperature, the Thermomelt mark, or the pellet, quickly liquefies. *Markal Co.*

... FOR MORE DETAILS, CIRCLE NO. 241

#### RESERVOIR FILTERS

... wide range of sizes, materials and ratings

A new series of reservoir filter replacement elements in three sizes of four different filter media with micron ratings from 2 to 100 have been made available. The new series are high quality, lightweight filters designed to protect cylinders, pumps, valves and other closely fitted parts in hydraulic systems. The three available sizes all have an outside diameter of 6-in. with lengths of two, four and eight in.



Two or more elements of the same or different sizes can be stacked in modular fashion in a single housing to meet flow requirements. *Bendix Aviation Corp., Filter Div.*

... FOR MORE DETAILS, CIRCLE NO. 242

#### HIGH TORQUE DRIVE

... for quarter-inch and larger electric drills

A high torque drive attachment that increases the drill's power seven times for driving and removing screws, nuts and bolts and for heavy-duty drilling. A hand clutch commands full control of power and safety at all times. With the use of "Yankee" style quick change snap-in bit holder and snap-in bits for slotted and Phillips screws, it drives the heaviest screws with ease and reverses for screw removal. Quarter-inch square socket wrench adapter in



high-torque drive converts power drill to fast, safe power wrench. *The Stanley Works*

... FOR MORE DETAILS, CIRCLE NO. 243

#### SOLVENT RECOVERY FAN

... gas-tight, spark-resistant for petro-chemical industry

Designed and built to minimize possibility of explosion in handling highly volatile solvent vapors, this fan is made with variable inlet vanes for volume control and a 50-in. diameter radial blade wheel made of aluminum with a cast manganese bronze spider. Rated at 200 bhp, the fan delivers 19,000 cfm. at 1,780 rpm., 100 F and 42.5-in. w. g. static pressure. *American-Standard Industrial Div.*

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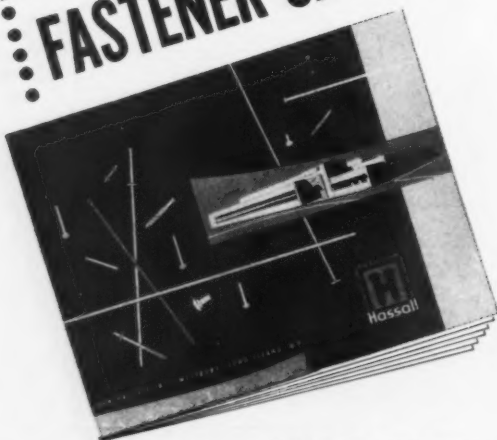
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### WELDING CABLE CONNECTOR

... joins securely with a twist of the wrist

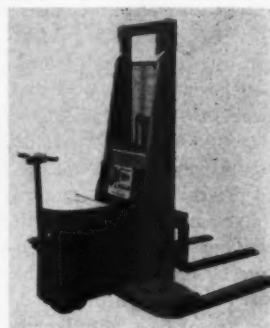
A patented eccentric-locking or wedging action provides an efficient electrical contact and prevents overheating in this new welding cable connector. Normal wear increases the contact area, extending connector life. The connector has no moving parts and molded neoprene covers prevent short circuits and outside arcing. The streamlined covers will not snag, and resist oil and grease damage. Individual male or female parts can be purchased separately. Soft copper sleeves permit cable attachment by either lead soldering or crimping. *Ampco Metal, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 245

### POWERED WHEEL DRIVE

... for battery-powered Hy-Boy Verti-Lifts

The incorporation of the powered wheel drive with its hydraulic fluid drive provides smooth starts and stops, and makes the 1500# range lifters and stackers become low investment "walkie-type" lift trucks. There are forward and reverse control buttons on the handle, breaking action is exerted when the steering handle is moved to the upright position. Spring-return construction of the handle automatically maintains the control handle, maintaining the



braking action in force when the machine is unattended. *West Bend Equipment Corp.*

... FOR MORE DETAILS, CIRCLE NO. 246

### MOBILE RADIO TELEPHONE

... operating range between 5 and 10 miles

Instant communication for industry to cut operating costs and to coordinate men and machines is possible with the new "Citizens-Band" mobile radio telephone. The "D" phone is a 5 watt mobile unit designed for operation on any two of the 23 available channels in the 26.96-27.33 Mc frequency band. It is available for either 12 volt DC or 117 volt AC operation with a 6 volt DC to follow soon. The unit is compact, measuring 8 3/4 x 5 x 8 in. and weighs 10 lb. *Kaar Engineering Corp.*

... FOR MORE DETAILS, CIRCLE NO. 247

### CONVEYORIZED ASSEMBLY TABLE

... on adjustable legs for adaptability

A newly designed Belt-able for the process industries consists of a flat belt conveyor with a table top on adjustable legs and can be adapted to practically any conveyor installation. The table top is adjustable transversely so that work can be performed on either or both sides. Available in lengths up to 75', with variable speeds from 5' to 120' per minute in a ratio of 3



to 1, or in several ranges of constant speed, it is suitable wherever there is processing, piece work, assembly, sorting, inspecting or similar work to be done. *Standard Conveyor Co.*

... FOR MORE DETAILS, CIRCLE NO. 248

#### RADIATION TEMPERATURE MEASUREMENTS

... especially applicable for recording and control

Sensitivity at low temperatures, direct-reading charts and scales, interchangeable head units, and automatic ambient temperature compensation are some of the unique features of the new Velotron Low-Range Pyrometer System. In operation, the pyrometer unit is sighted on the surface to be measured, by use of an eye-piece on the unit. The instrument automatically corrects for ambient temperature and records the corrected measurement. A simple knob adjustment on the instrument corrects for emissivity of surface being measured. It measures temperatures in ranges from 0 deg. F to 200 deg. F, up to 1100 deg. F. Bristol Co.

... FOR MORE DETAILS, CIRCLE NO. 249

#### MICROHARDNESS TESTER

... semi-automatic, indentation loads 25 to 1,000 grams

Modern styling of this new tester will expedite the testing of cutting tool carbide tips, watch springs, instrument pivots, surgical needles, electroplated surfaces, sheet metal, metallic constituents, surface conditions, paints and plastics for hardness properties. Ruggedness of the tester will enable its effectiveness in the production line as well as the lab. With its vertical capacity of 2½ in., microhardness characteristics of metals and materials can be checked with ease and reliability. The instrument is equipped with a rigidly mounted, high-powered, Bausch & Lomb microscope. American Chain & Cable Co., Inc.

... FOR MORE DETAILS, CIRCLE NO. 250



## Cut Costs of Hydraulic Line Maintenance!

**New Aeroquip Catalog Has Specific Product Data on Hose, Fittings, Adapters for All Fluid Line Applications**

Purchasing agents and maintenance engineers: Here is clear, complete information on easy-to-assemble Aeroquip Hose Lines and Reusable Fittings. New Catalog No. 204 covers hydraulic, air, lube, water, steam and special purpose hose lines. For your copy of new Catalog No. 204, or for fast delivery of your hose line needs, call your Aeroquip Distributor today. He's listed under "Hose" in your Yellow Page Phone Book.

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## MOYNO—the problem solving pump

If your pumping problems are a little different, the entirely different MOYNO may be exactly the pump you need. Its unique helical screw operation makes tough pumping problems easy—enables the MOYNO to handle almost anything that will push through a pipe, from free-flowing liquids to non-pourable abrasive pastes; even handles substances containing solids in suspension. Only one moving part—no pistons, no valves, no high-speed impellers. Provides positive displacement, low turbulence, continuous uniform flow. Capacities to 500 gpm; pressures to 1000 psi. Also available in sanitary types.



## FERNHOLTZ MACHINERY COMPANY

8468 W. Melrose Pl., Los Angeles 46  
Phone OLIVE 3-2360

Send for free copy of Bulletin 30C-WI

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**PORTABLE INDICATING PYROMETER**  
... for temperatures minus 40 degrees F. and 200

New version of a portable indicating pyrometer is primarily intended to measure temperatures between minus 40 deg. F and 200 deg. F. It does this by means of two scales or arcs in order to provide one deg. F. per scale division and therefore readability to at least the nearest one-half deg. F. The Alnor type 2300-B pyrometer is aimed at indicating temperatures which are not very far from normal room temperatures. The instru-



ment can be used for many different kinds of temperature measurements. *Illinois Testing Laboratories, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 249

**VERTICAL FLUID MIXERS**  
... features case hardened, precision ground gearing

New gear drives having hardened, precision ground gears result in a greater load-carrying capacity and longer life with reduced sound level and vibration. The vertical fluid mixers are made in standard models ranging from 1 hp. to 200 hp. and special models up to 500 hp. Mechanical seals or packed stuffing box may be specified and paddle or turbine-type impellers are available. *Philadelphia Gear Corp.*

... FOR MORE DETAILS, CIRCLE NO. 250

*the finest*  
**COATED FABRIC**  
**WORK GLOVE**  
*in the world*  
**SURETY**  
**SILVERTEX**



To handle those hot, tough jobs nothing equals Surety Silvertex Gloves for longer wear and lower cost. Superior Silvertex coating reflects heat and affords better protection against most industrial chemicals than rubber and standard synthetics. Their curved finger design and wing thumb construction cuts wear and gives greater comfort. And they won't crack or peel—remaining soft and pliable for the life of the glove.

Available in gauntlet, knit wrist, band top and safety cuff styles, all in jumbo sizes and with or without ventilated backs. For a free test pair write on your letterhead, outlining your job requirements. We'll send them to you by return mail.

THE **SURETY** RUBBER COMPANY  
CARROLLTON, OHIO

Western Sales Rep.: The Macintosh Co.  
3030 Bridgeway, Sausalito, Calif.

... for more details, circle No. 39 on Reader Service Postcard

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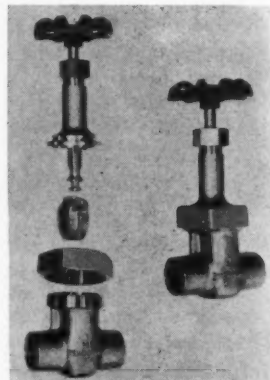
**PLASTIC TAPE**  
... for full sealing protection of threaded pipe joints

A chemically-inert plastic tape designed to seal and to permanently lubricate threaded and coupled pipe joints. This unfused film tape can be applied in seconds and conforms to all types of pipe threads and fittings in any pipe system, low pressure or high, up to thousands of psi. A few of the applications for this tape include gas meter hook-up oil casings, oil rigs and refineries, chemical plants, conduit, couplings, valve sealing, high pressure systems and chemical lines. This white, pliable 1/2-in. wide tape is available in 260-in. or 520-in. lengths on handy pocket-size rolls. *Minnesota Mining & Mfg. Co., Irvington Div.*

... FOR MORE DETAILS, CIRCLE NO. 251

**SOLDERED VALVE**  
... high grade copper tubing for industrial use

Soldered joint valves with a union bonnet and rising stem have been developed in sizes from 3/8-in. through 3-in., inclusive. The valves have a pressure rating of 125 lb. The union bonnet eliminates distortion caused by mechanical strain or temperature changes. With the exception of the body of these new valves, all of the parts are interchangeable with those of the manufacturer's screwed-end, 125-lb., rising stem



gate valve of the same size. *Walworth Co.*

... FOR MORE DETAILS, CIRCLE NO. 252

**FLAME RETARDANT RECEPTACLES**  
... for safe material handling where fire may be a hazard

Made of Pyronil, a flame retardant grade of vulcanized fibre, these receptacles are available as trays, pans, bins, boxes, floor trucks, baskets and containers. When a 1/8 in. specimen of Pyronil is held horizontally in the flame of a Bunsen burner for ten seconds, the specimen extinguishes itself in only one second after removal. Plus being flame retardant, the units are light-weight and strong. *National Vulcanized Fibre Co.*

... FOR MORE DETAILS, CIRCLE NO. 253

CALL  
**NEvada**  
**6-1251**

**Specify**  
**DAYTON**  
**Sorbocast**

**DAYTON FOUNDRY**

HOLLYDALE, CALIFORNIA

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WESTERN INDUSTRY/JANUARY 1960





# WESTERN INDUSTRY NEWS

THE INDUSTRIAL WEST . . . ON IT'S WAY

PLANTS • PRODUCTION • DISTRIBUTION • PERSONNEL

## \$16,000,000 Cement Plant Opens in Clarkdale, Ariz.

CLARKDALE, ARIZ. — Over 300 people attended the recent grand opening of the \$16,000,000 Phoenix Cement Co. plant in Verde Valley near here. The facility, which has a capacity of about 1,850,000 barrels yearly, includes a quarry, offices and several buildings in addition to the plant proper. The plant, which has been under construction for over 20 months, will have about 130 permanent employees.

One of the most advanced plants of its kind, the facility is practically smokeless and has no stack.

Leading officials of American Cement Corp., of which the Phoenix firm is a division, attended the opening, including *W. C. Russell*, president of ACC and *Garner Becket*, board chairman. *Ray Adams*, Phoenix plant president, was master of ceremonies.

American Cement also has a plant in Oro Grande, Calif., for which expansion plans are under discussion. Another affiliate, Hawaiian Cement Co., is planning a facility in Hawaii.

## Ultek Signs Agreement With Kinney Mfg. Div.

PALO ALTO, CALIF.—The Ultek Corp., which recently announced its entry into the development and manufacture of a line of electronic high-vacuum pumps, has signed an agreement with Kinney Mfg. Div., New York Air Brake Co. who will act as exclusive international sales agent for these Ultek devices.

The new agreement covers all areas of the world except Northern California, Oregon and Washington. Sales and application-engineering activities will be handled through Kinney's nationwide sales offices and through its international affiliations. Ultek is headed by *Dr. Lewis D. Hall*, formerly of Varian Associates and active for many years in the high-vacuum field.

## Remco Buys Hypower Cylinder Division of Turlock Iron

WILLITS, CALIF.—The Remco Mfg. Co., here, a Division of Firco Inc., has acquired the HyPower Cylinder Div. of the Turlock Iron & Machine Works at Stockton, Calif.

Remco, manufacturers of hydraulic and air cylinders, anticipates a gradual increase in the variety of cylinders available plus refinements in the quality and appearance of the HyPower line. Effective date of the sale was January 9, 1960.

## Standard Oil Building Huge Chemical Plant

RICHMOND, CALIF.—Construction of a multi-million dollar plant for the manufacture of the chemical maleic anhydride has been started at the Richmond Refinery of Standard Oil Co. of Calif. The 20 million pound-per-year installation is being built by the Badger Mfg. Co. of Cambridge, Mass., for Oronite Chemical Co., a Standard subsidiary. Completion is scheduled for mid-1960.

Maleic anhydride is a chemical intermediate widely employed in production of plastics for boats, auto bodies and household appliances; high grade paints; textile wetting agents and agricultural chemicals.

## Power Supply Company to Double Production Area

OAKLAND—Glenn Pacific Power Supply Corp. will double its production area with a new building adjacent to present facilities at 703 37th Ave. Completion of the new structure is expected early this month.

Glenn Pacific manufactures specialized power supplies for automatic and manual welding and for general industrial use. The new building will provide research and development facilities, said *George G. Glenn*, president.

## New Plant, Warehouse For Pioneer Aluminum

LOS ANGELES—A \$1,000,000 new construction program has been announced by Pioneer Aluminum Inc., distributor of aluminum aircraft extrusions in the West.

The building will contain almost four acres of floor space, devoted to warehousing huge inventories of aluminum aircraft extrusions, stainless steel in all forms, aluminum tooling plate and aluminum bar, rod, wire, sheet and plate.

Warehouse and general offices will be integrated with a completely new and specially designed communications system, including public address paging networks, intercom telephones and a pneumatic tube system. The new facility will be located at 3800 East 26th St., in the Vernon section of Los Angeles, and is scheduled for occupancy about June 30, 1960.

## Aberdeen Plywood Plans New Plant

SEATTLE—Aberdeen Plywood and Veneers, Inc. have announced plans to build a \$1,400,000 plant to produce particle board on property owned by the Port of Grays Harbor.

Half of the production of the new plant will go into the company's own production as core stock sandwiched between hardwood panels. The rest will be sold on the open market. The particle board will be made of alder, cottonwood and cedar chips.

## Easter-Owens Moves

DENVER — Easter-Owens Electric Co., manufacturer of custom-built electric control switches and panels for heavy industry, has moved into its new building at 610 S. Lipan St., from 4200 Fox St., according to *William T. Easter*, co-owner with *Albert F. Owens*.

GEARS FOR INDUSTRY  
**THE Lufkin LINE**  
OIL FIELD PUMPING UNITS

## ON THE WAY TO SEATTLE

In the City of Portland, Ore., popularly referred to as "City of Roses," an entire new business-real estate development is in progress. The new Sheraton-Portland Hotel, just recently opened, overlooks a mammoth new shopping center complete with major department store and numerous other stores like Woolworth, Penney's, Grant's, etc., ample parking, all on a scale that would rival a Los Angeles super-super shopping business center.

I suppose the only reason that this can legitimately be included as copy for the column is that the observation was made in line of duty while looking into some dam gear projects (not that kind) for some dam work planned on the Columbia River.

But for the oil minded in California, it should be interesting to know that this new development in Oregon is basically attributed to the Lloyd Corporation.

For myself, there was a pleasant surprise in store. I feel sure that many of you who have returned to a town or city where your family once lived might share a quiet delight, like the Monday morning after arrival in Portland, trying to get re-oriented to old familiar sights from a hotel window, much to my astonishment, just across the street from the new Sheraton was the old school house—Holladay Park. Gosh, that used to be the end of town, and this was the least expected landmark to find in what I thought was a new section of the city.

In Portland, Lufkin Gears for Industry are represented by J. W. Mindler Chain and Gear Company.

In Seattle, our gear products are in the capable hands of Marine and Industrial Supply Company.

*V. J. Fawcett*

**Lufkin FOUNDRY  
& MACHINE COMPANY**



V. J. Fawcett

## Stauffer Chemical in Plastic Pipe Field

VERNON, CALIF.—The Plastic Pipe and Tube Division of Anesite Co., Santa Barbara, Calif., has been acquired by the Stauffer Chemical Co.

Under the terms of the acquisition, Anesite is providing Stauffer with its complete know-how in the extrusion of plastic pipe, tubes and special shapes. Stauffer is also licensed to produce and sell under the Anesite brand names.

In turn, Stauffer has appointed Anesite as a sales agent in the Western states for plastic pipe, tube, fittings and custom extrusions.

## Hastings Plastics Acquires Warehouse

SANTA MONICA, CALIF. — Continuing growth of Hastings Plastics, Inc., has resulted in the acquisition of adjacent warehouse space here formerly leased to J. P. Stevens and Co. as West Coast storage facility for their glass fabrics products.

The addition increases Hastings' warehouse area by 4000 sq. ft. and permits greater ease in handling and warehousing of their plastics materials and supply products.

## Iron Fireman Completes Aircraft Div. Streamlining

PORTLAND—Completion of the installation of over \$300,000 worth of new steel and aluminum processing equipment at its aircraft div., 4784 S. E. 17th Ave., here, has been announced by the Iron Fireman Mfg. Co.

The new equipment is comprised mostly of contour, tracer type milling machines, designed and built especially for the aircraft div. The special machines will be used to machine parts for supersonic jet aircraft and guided missiles.

The installations are part of an overall expansion program started two years ago. The aircraft div., now in full operation, turns out completed aircraft control units such as rudder pedal and steering column assemblies as well as aisle stands which contain the throttle, trim tabs and other primary controls.

## Lerco-Micro Gee

LOS ANGELES — Micro Gee Products, Inc., of Culver City, has been acquired by Lerco Electronics, Inc., Burbank producer of insulated terminals and other electronic equipment. Micro Gee manufactures electronic simulation tables for testing missile and space flight controls.

# HUB CITY

**Model 99—EXTRA HEAVY DUTY** 115 H.P. capacity. Choice of 40 to 6, 37 to 7 or 53 to 8 gear ratios. Totally enclosed cast iron gear case. Ring gear carrier and pinion mounted on Timken bearings; spring loaded grease seals. Four tapped mounting holes on both sides of case. Shipping weight 135 lbs.

**Model 77—HEAVY DUTY** 85 H.P. capacity. Adaptable to any application requiring angle drive with high torque output with moderate speed reduction. 3.77 to 1 ratio automotive type ring gear and pinion. Similar in design to Model 99. Shipping weight, 85 lbs.

**Model 88—STANDARD DUTY** 65 H.P. capacity. Gear ratios of 1:1, 1½:1, 2:1 and 3:1. Mounting holes both top and bottom for convenience and reversal of rotation if desired. Shipping weight, 90 lbs.

**Model 66—UTILITY DUTY** 40 H.P. capacity. Gear ratios of 1:1, 1½:1, 2:1. Mounting holes both top and bottom. Shipping weight, 50 lbs.

**NEW MODEL 44**—Designed for either speed up or reduction drive in line without changing direction of rotation. Available with two output shafts. Totally enclosed cast iron case. High speed roller chain and sprockets run in constant oil bath. Both shafts equipped with Timken roller bearings in adjustable housings.

**W33 SERIES**—Worm Gear Speed Reduction Unit is adaptable for applications requiring high torque, slow RPM output with low torque, high RPM input.

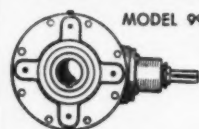
**UNIVERSAL ADAPTABILITY.** The position of Hub City Gear Boxes can, for many installations, be reversed in either a horizontal or vertical position in order to obtain clock-wise or counter clock-wise rotation of input and output shafts without ordering special boxes or changing the location of gears. MORE APPLICATION FROM MINIMUM INVENTORY.

**GREYER & GREYER, Western Factory Sales Representatives**  
P. O. Box 47, Stockton, California

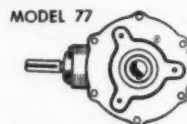
P. O. Box 1036, Perry Annex, Whittier, California  
or write for complete specifications to:

**HUB CITY IRON CO., Aberdeen, South Dakota**

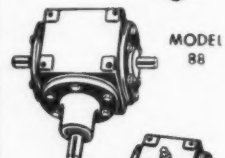
## UNIVERSAL GEAR BOXES



MODEL 99



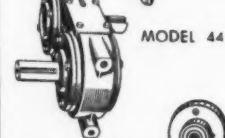
MODEL 77



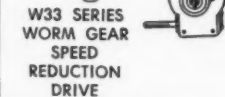
MODEL 88



MODEL 66



MODEL 44



W33 SERIES  
WORM GEAR  
SPEED  
REDUCTION  
DRIVE

... for more details, circle No. 41

... for more details, circle No. 42 on Reader Service Postcard

WESTERN INDUSTRY/JANUARY 1960

## Fairchild to Build Plant in San Rafael

SAN RAFAEL, CALIF. — Marin County will have its largest industrial plant in operation by June 1, 1960, and by the end of 1961 is expected to employ 1,000, according to Dr. Robert N. Noyce, vice president and general manager of Fairchild Semiconductor Corp. Marin County is north of San Francisco, across the Golden Gate Bridge.

The California company is a wholly-owned subsidiary of Fairchild Camera and Instrument Corp., Syosset, L. I., N. Y. Dr. Noyce, head of one of the nation's major manufacturers of silicon transistors at Mountain View, Calif., reported that the plant will represent a multi-million dollar investment and that Fairchild is spending a similar amount for an expansion program at Mountain View that will double the present space.

Fairchild's diode manufacturing has begun operation in 5,000 sq. ft. of leased space at 27 Jordan St., San Rafael, until the new construction is completed.

According to Dr. Noyce, Fairchild's growth in two years has been dramatic and significant to the electronic industry. On October 1, 1957, eight young California scientists organized a new company, with a borrowed name and borrowed capital. "We believe our new location in Marin County is a happy choice," Dr. Noyce declared. "It is recognized that in highly specialized fields such as ours, stress must be placed on plant location and community environment in order to attract scientists, research specialists and production personnel."

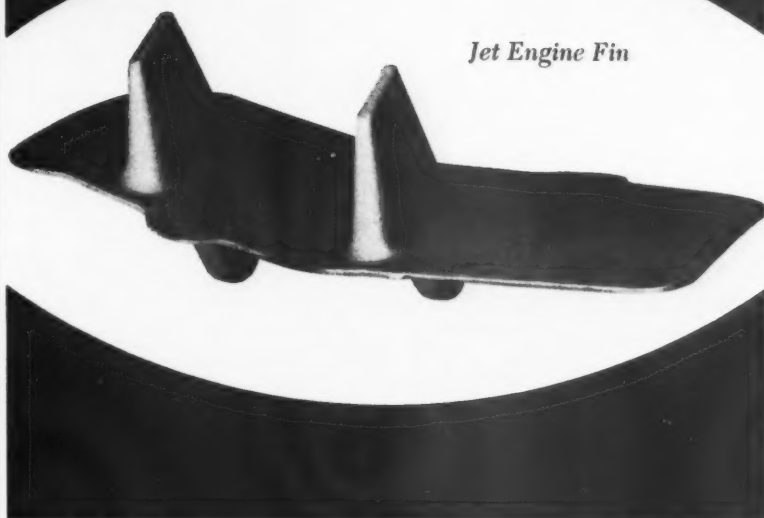
## Networks Electronics Completes Expansion

VAN NUYS, CALIF.—A \$120,000 expansion of its recently created Infra-red Laboratories was completed last month by Networks Electronics Corp., 14806 Oxnard St., manufacturer of miniaturized precision electronic components for the aircraft-missile industry.

## Sacramento Firm Expands

SACRAMENTO — Vernier Missile Systems, Inc. of Rancho Cordova has revealed plans to construct two additional buildings at a cost of over \$1,500,000. Located at 10575 Folsom Blvd., the company was founded 16 months ago. Employment is expected to increase to 150 by the end of next year and 350 by the end of 1962.

THE  
PART THAT  
"COULDN'T  
BE  
FORGED"



*Jet Engine Fin*

The jet engine fin shown above, is just one of many difficult configurations that Arcturus has forged after others said it couldn't be done. Originally these fins were machined from a forged rolled ring...a time-consuming, expensive procedure.

Using their highly-advanced techniques, Arcturus developed a method for forging the part, saving substantially on material and machining time...resulting in a cost reduction of 38%.

Chances are you are now buying machined parts that Arcturus could forge much more efficiently...saving substantially on material, weight, machining and total cost. High and low temperature alloys are our specialty. Why not send us those drawings and specifications right now?

FORGE AHEAD WITH

**Arcturus**



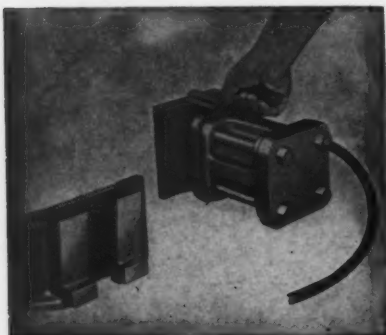
**MANUFACTURING CORPORATION**

4313 Lincoln Blvd., Venice, California • UP 0-2751

... for more details, circle No. 43 on Reader Service Postcard



## CLEVELAND'S NEW PORTABLE VIBRATOR



### Lightweight Well-Balanced

Having trouble with materials sticking to your portable bins or trucks? The Cleveland Type LSRRH Portable Vibrator is just what you've been looking for. This lightweight, well-balanced portable is designed for equipment such as concrete forms, septic tanks or large pipe forms that do not require a permanent vibrator installation.

The Cleveland Type LSRRH Portable Vibrator develops 7000 to 8000 vibrations per minute, maintaining a free flow under all conditions. A cast steel bracket holds the LSRRH securely in place, making it ideal, even for heavy duty use.

For more detailed information, write for our illustrated catalog.

This new portable vibrator is just one of The Cleveland Vibrator Company's complete line of air and electric vibrators. You'll find a type and size vibrator for your every requirement.



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2914 Clinton Avenue • Cleveland 13, Ohio  
1483 Bayshore Blvd. • San Francisco 24, Calif.  
... for more details, circle No. 44

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## Pacific Abrasive To Distribute For Allegheny Ludlum



LOS ANGELES—Pacific Abrasive Supply Co., Inc., consummates negotiations with the Carmet Div. of Allegheny Ludlum Steel Corp. to distribute cemented carbide tools, blanks, indexable inserts and tool holders. Pictured at the contract signing are, from the left: J. E. Turk, assistant district manager, Allegheny Ludlum Steel; Gardner Reynolds, sales manager, Pacific Abrasive Supply; Denton

Hassel, manager of distributor sales for the Carmet Div.; Harry Bayley (seated), vice-president and general manager, Pacific Abrasive; and Leon Bohrer, salesman for Allegheny Ludlum.

The new distributor has stores in Santa Ana, El Monte, Van Nuys, San Leandro and Mountain View, Calif., in addition to Los Angeles.

## Bill Jack Names Manufacturing Rep

SOLANO BEACH, CALIF.—Key Electronics of Hollywood has been appointed manufacturer's representative for Bill Jack Scientific Instrument Co. of Solano Beach.

Clayton G. Jack, president of the instrument firm, states that its regular marketing personnel will be supplemented by Key in the Los Angeles, San Diego and Phoenix-Tucson areas.

Digitac, Inc., a wholly-owned subsidiary of the Bill Jack company, will also be represented in the same areas by Key Electronics.

## Steel Industry Raw Materials Research

PROVO, UTAH—One of the most advanced new raw materials research laboratories in the steel industry has been started at Geneva Works in Provo and is scheduled for completion early in 1961. The center will conduct intensive studies on western produced iron ores, coal, coke and other raw materials used in steel making.

## Electronics Experts Launch Instrument Firm

VENICE, CALIF.—A new electronic instrument company, Electro-Logic Corp., has been founded in the Los Angeles area with headquarters at 515 Boccaccio Ave., Venice.

Electro-Logic will develop, manufacture and market a line of electronic instruments for industrial and scientific use. It expects to introduce its first product, a new, low-cost digital-indicating voltmeter, this month.

The new firm is headed by Vincent A. van Praag, who was formerly manager of special products for Bendix Aviation computer division and recently resigned as director of marketing of the Packard-Bell Computer Corp. to organize the new company. Vice president for engineering is George J. Giel, former chief engineer of the instrument division of Genisco, Inc., Los Angeles. Midwest Technical Development Corp., a Minneapolis investment company, is supplying \$50,000 of the company's initial capital.



## Yuba Consolidated Buys Indiana Firm

SAN FRANCISCO—President John L. McGara of Yuba Consolidated Industries, Inc., and Joseph T. Sohn, president of the Bedford Foundry & Machine Co. Inc., have announced that Yuba will acquire the assets of Bedford, including plants and machinery valued at about \$600,000.

To be known as the Yuba-Bedford div., the acquired company will provide Yuba with additional manufacturing facilities in the midwest for some of the Yuba products now being built on the West Coast.

Bedford Foundry builds and designs electric traveling bridge, gantry, and hand cranes. The company fabricates structural steel, manufactures steel derricks, stone working machinery and other engineered mechanical products.

## Schlage Lock Acquires Plant

SAN FRANCISCO—Schlage Lock Co. has purchased three acres of South San Francisco land on which it will erect for Bodinson Mfg. Co. a new plant, taking in exchange the present Bodinson factory building and land.

The two companies are now neighbors in the 2200 block of Bayshore Blvd. A steel fabricator, Bodinson makes heavy conveyors for rock and gravel plants. Bodinson will move its operations and manufacturing facilities to South San Francisco as soon as Schlage completes construction of its new facilities.

## Future Products Firm To Expand Facilities

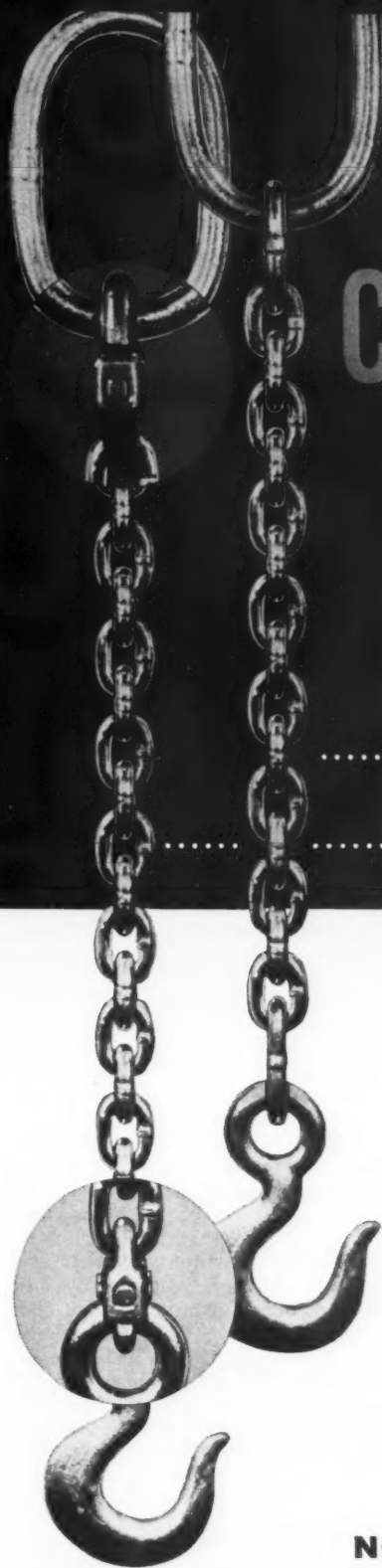
GARDENA, CALIF.—Future Products Engineering Corp. has announced a new expansion program and a relocation of the facility at 13021 Budlong Ave., here.

President Nick G. Stasinos states that the move was made necessary by the acceleration of engineering and development contracts from the prime contractors in the area. The new facility doubles the floor space previously occupied by the firm.

## Aluminum Products Plant Due at Nyssa

NYSSA, ORE.—Ground work has begun for construction of an aluminum products plant. The plant is being built by Midwest Structural, Inc., in a new industrial area near here. The firm plans to manufacture containers for local potato products, light fixtures and other items.

... for more details, circle No. 45 →



# Now—two kinds of CAMPBELL SLING CHAINS

..... FACTORY-MADE  
..... CUSTOMIZED

...both with the same strength  
and working load limits!

## CAMPBELL Factory-Made SLING CHAINS

Available in all styles from Campbell's three strategically located plants. In three grades: Cam-Alloy, Wrought Iron, High Test Steel. Campbell Certificates of Test issued for your safety. Write today for Catalog S-558.

## CAMPBELL Customized SLING CHAINS

You can order slings assembled by Campbell distributors or at Campbell factories and warehouses from pre-tested components. Or you can assemble slings right on the job. In single or double types, Alloy grade. Certificates of Test issued for complete assemblies or components. Write today for Catalog CSA-1.

**NOW AVAILABLE** from the new  
Campbell plant in Union City, California

**CAMPBELL  
CHAIN**

**CAMPBELL CHAIN Company**

FACTORIES: York, Pa.; West Burlington, Iowa; Union City, Calif.

WAREHOUSES: E. Cambridge, Mass.; Seattle, Wash.; Portland, Ore.;  
Atlanta, Ga.; Dallas, Texas; Chicago, Ill.; Los Angeles, Calif.



## "THIS LUBRICANT PRACTICALLY ELIMINATED BEARING REPLACEMENTS"

Says- C. O. SPARKS, INC.  
& Mundo Engineering Co. of Los Angeles, Calif.

"Prior to using LUBRIPLATE, we were replacing shaker screen bearings within 60 to 120 days due to lack of or faulty lubrication. Since we started using LUBRIPLATE seven years ago, we have only replaced two shaker screen bearings and these because of natural wear. We now use LUBRIPLATE for general lubrication throughout our plant."

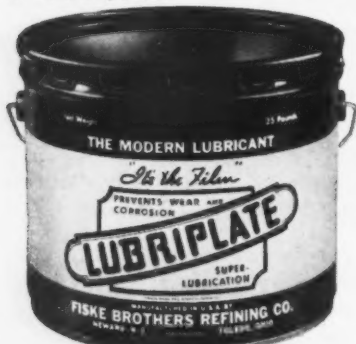
W. T. Ellington, President  
Mundo Engineering Co.

**REGARDLESS OF THE SIZE AND  
TYPE OF YOUR MACHINERY,  
LUBRIPLATE GREASE AND  
FLUID TYPE LUBRICANTS WILL  
IMPROVE ITS OPERATION AND  
REDUCE MAINTENANCE COSTS.**

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.



For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



... for more details, circle No. 46

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## New General Offices of Ziegler Steel



OAKLAND, CALIF.—As Ziegler Steel Service Corp.'s Oakland Division celebrated their tenth anniversary of operations in the San Francisco Bay Area, the company also announced the opening of their new general offices at 727 66th Ave. in Oakland.

The offices were designed by Wayne A. Littlejohn, architect; General Contractors Oliver and Coburn handled all phases of the construction. Ziegler Steel commemorated their 10 years of operations in the Bay Area with a party at the Fairmont Hotel.

## Telecomputing Corp. Acquires Phoenix Engineering

LOS ANGELES—The assets of Phoenix Engineering and Mfg. Co. of Phoenix, Arizona, have been acquired by the Telecomputing Corp. of Los Angeles. Phoenix Engineering manufactures precision missiles, aircraft and electronic parts.

Terms of the purchase were not disclosed, but the transaction does not include the issuance or exchange of Telecomputing stock, according to William R. Whittaker, president of Telecomputing Corp. The firm is located in a modern 20,000 square-foot plant on a two-acre site in one of the new industrial areas of Phoenix.

Harold C. Olson, who founded Phoenix Engineering in 1950, will continue as president. Donald A. Hendricks, formerly plant manager of Telecomputing's Whittaker Controls Div. at Lynwood, Calif., has been named vice president and general manager of the new subsidiary which will be under the over-all responsibility of Bernard N. Maas, executive vice president of Telecomputing.

## New Sales Agency

SAN MARINO, CALIF.—Brown Fintube Co., Elyria, O., announces that a new sales engineering agency formed by R. T. Ferguson will represent the Brown heat transfer products in Southern California. Offices of the new firm are at 1016 Roxbury Road here.

## Expand Facilities For Azorizing Process

VERNON, CALIF.—Atwood Plating Div. of Atwood Machinery Co. has moved to a larger plant where new specialized plating equipment is in operation as part of a major expansion program to meet increased demand from aircraft and missile industries for the azorizing process, reports L. F. Atwood, president.

In addition to the expanded azorizing facilities installed in the 12,000 sq. ft. plant at 2124 E. 51st St., other new facilities include: a major hard anodizing facility, a set-up for electroless nickel, a precision hard chrome installation, and a department for the application of solid film lubricants.

The azorizing process is a method for applying a high chromium alloy deposit used primarily on aircraft and missile parts to increase wear life and corrosion resistance.

## Meletron Names Pacific Airmotive Distributor

BURBANK, CALIF.—Appointment of Pacific Airmotive Corp. as Western distributor of aircraft pressure sensing devices manufactured by Meletron Corp., Los Angeles, has been announced jointly by the presidents of the two companies, John W. Myers and George A. Starbird, respectively.

Pacific Airmotive branches in Burbank and Oakland, Calif., Seattle and Honolulu will all warehouse and distribute Meletron's line of pressure-actuated switches.

## New Technical Center For Miniature Bearings

LOS ANGELES—A new Western technical center and sales office was opened recently by the Miniature Precision Bearings, Inc., at 8621 Bellanca Ave. here.

Main feature of the new building is a unique pressurized "white room" laboratory containing equipment especially designed to solve client problems in minimum time. The laboratory is so finely air-conditioned that particles larger than .3 microns (12 millionths of an inch) are filtered out.

Horace D. Gilbert, president of the company, said the new Center will provide greatly expanded engineering services for customers in the Western region.

## Red Comet Acquires Fire Equipment Firm

DENVER—Red Comet, Inc., manufacturer of automatic vaporizing liquid fire extinguishing equipment, has announced purchase of the Nelson Fire Equipment Co., 1354 Larimer St.

Max Romero, general manager of Red Comet, said Fred Colyer will manage the new Denver division and that Paul Nelson, former owner of the Denver firm, has joined Red Comet as probably the most informed technician in the field of portable fire extinguishers in this region.

The firm also announced a new mobile service truck which is equipped with a 110 volt generator, spare parts and loaner units for extinguishers occasionally needing hydrostatic tank testing. All other services can be provided on the job from the mobile unit.

## Eight Million Expansion for Varian

SAN FRANCISCO—Dr. Edward L. Ginzton, board chairman of Varian Associates, has announced plans for plant expansion that will cost eight million dollars during 1960.

Ginzton said that construction is already under way on several building projects that will add 250,000 sq. ft. to the existing 300,000 sq. ft. at their Palo Alto plant.

The electronic company will also undertake expansions at two subsidiaries, the Bomac Labs at Beverly, Mass. and Varian of Canada, at Georgetown, Ont. By the end of the year, the company will have 770,000 sq. ft.



## Tips to help you cut impact socket breakage



- Position power wrench so that socket fits straight on nut. Tilted wrench causes binding and socket breakage.
- Use right size socket . . . replace worn or undersize nuts. Loose-fitting sockets wear faster — then break.
- Don't keep impacting after nut is tightly set. This causes needless wear on both wrench and socket.
- Keep the inside of sockets clean. Dirt and grease are common causes of socket breakage.
- When power wrench drive head becomes worn — replace it. Loose drive causes excess wear in socket drive opening — early socket breakage.

## Best tip yet!

**ALWAYS USE *Snap-on* INDUSTRIAL SOCKETS**

Sockets used on power nut runners and impact wrenches take a terrific pounding. Standard hand-wrench sockets are not designed for this work. Snap-on heavy-duty industrial sockets have the extra heft and toughness to take the beating. Result: more work-hours per socket and, equally important, less costly downtime resulting from fre-

quent breakage of ordinary sockets.

Final tip. Talk sockets with your Snap-on man. Take advantage of his specialized tool knowledge, and his competent advice on what is best for you in the wide range of Snap-on industrial sockets. Your nearby Snap-on branch office provides prompt emergency or regular service.



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## Morse Open House at Los Angeles



LOS ANGELES — Morse Chain distributors shown here formally celebrated the opening of the West Coast "master warehouse" of the Morse Chain Company at 5071 Telegraph Road, Los Angeles, last month. This new facility makes possible the immediate filling of orders in the Southland industrial complex. In addition to storage for inventory, a limited amount of repair is accomplished here and certain power transmission items are fabricated by

vendors for Morse in the Los Angeles area. Sales, service and engineering personnel headquarter here. Shown from left to right are *John D. Danberg*, vice president, Chain Gear Inc., Seattle, Yakima, Wash.; *Kenneth D. Adam*, The Adam Hill Co., Oakland, Calif.; *Fred F. Coates*, The Adam Hill Co.; *Horace Plimley*, Western Equipment Ltd., Vancouver, *Frank Morriss*, same firm; *Peter Fediw*, also Western Equipment at Victoria, B. C., all Morse distributors.

## Corrugated Container Plant Groundbreaking

GOLDEN, COLO. — Groundbreaking ceremonies on the \$2.5 million corrugated container plant to be constructed in Jefferson County by the Boise Cascade Corp. took place last month.

*William Bridenbaugh* recently was named sales manager of the plant at West 44th Ave. and McIntyre St. which will employ some 55 persons.

Cascade Container Corp. operates corrugated container plants in Burley, Idaho, and Wallula, Wash. These operations, in conjunction with the pulp and paper mill of Cascade Kraft Corp., also located at Wallula, comprise the paper division of the Boise Cascade Corp.

## New Transicold Plant

LOS ANGELES — Representing a capital investment in excess of \$500,000 for land and building, a new plant will be completed this month in Montebello, Calif., for the Transicold Corp., manufacturers of transportation equipment. New equipment costing more than \$150,000 is being installed, according to *John H. Grim*, president. The new facility, located at 1100 South Taylor Ave., will allow a production rate at least four times that of the current facility. The company's units go into truck trailers, container units and military equipment requiring temperature control.

## Mill-A-Matic Breaks Ground at Santa Ana

SANTA ANA, CALIF. — A \$250,000 machine production tool shop is under construction here and is scheduled to be open for business in March, 1960.

The plant, containing 8,000 sq. ft. of floor space will be a one-story structure. The five company officials are from the Los Angeles area. They are: President *Vaughn Clark*, Secretary-Treasurer *Robert Knutson*, Sales Manager *Eugene Walloch*, *Lloyd Maxwell* and *Peter Wanbaugh*.

## Amadon Forge Plans Expansion

LONGVIEW, WASH. — A \$100,000 modernization and expansion program has been announced by Amadon Forge & Machine Works. The program will include both additions to buildings and equipment. A new hydraulic press to build paper-filled super calender rolls for the paper industry will be installed. Machine shop equipment will be replaced with new tools.

## Weyerhaeuser Names Reps

TACOMA — Three new panel products distributors have been appointed by the Silvatek Div. of Weyerhaeuser Co. They include *Lumbermen's Supply Corp.*, Spokane; *Kochton Plywood*, Chicago and *Kochton Plywood* at Saginaw, Michigan.



## Lockheed to Form Electronics Subsidiary

BURBANK, CALIF.—With the objective of attaining a balanced market penetration between military and non-military electronics, Lockheed President Courtlandt S. Gross has announced plans to form a new subsidiary, the Lockheed Electronics Co.

The new corporation will include the recently acquired Stavid Engineering, Inc., and the Lockheed Electronics and Avionics Div. (LEAD). These will be renamed the Stavid Div. in Plainfield, N. J., and the Newport Div., in Newport Beach, Calif.

Lockheed recently began work on a 200-acre site at Newport Beach for a modern electronics research and manufacturing center. This facility will serve as the headquarters for the Newport Div., which also will include the present LEAD plant in Los Angeles.

## Garland Steel Named Alcoa Jobber

PHOENIX — The Garland Steel Co. here has been appointed an Alcoa sign products jobber, the Aluminum Co. of America has announced.

R. C. Benedict, resident manager of Alcoa's Phoenix sales office, said Garland will handle such products as aluminum sign blanks, both mill finished and anodized, aluminum fasteners; aluminum pipe for use as sign or parking meter posts; street name sign components, both extruded and cast; and aluminum delineator posts.

## All-State Welding Expands Facilities

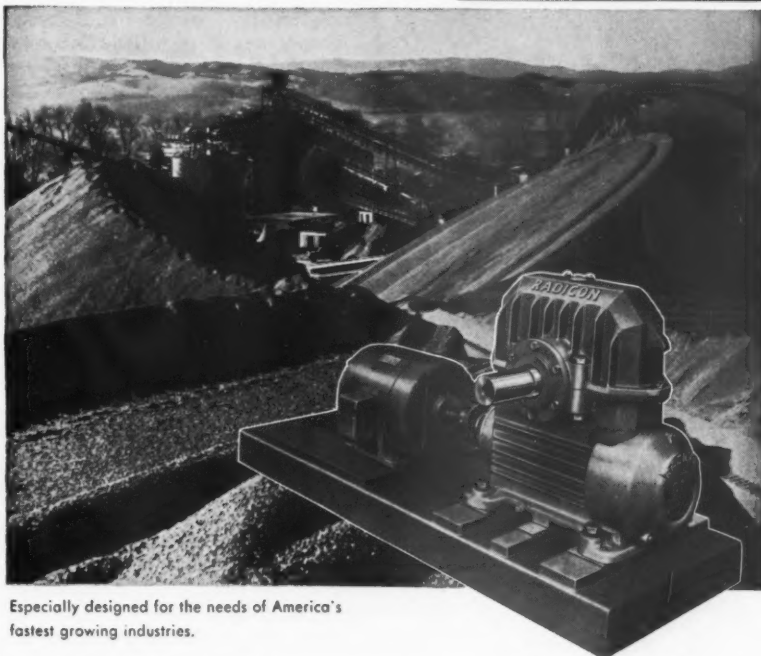
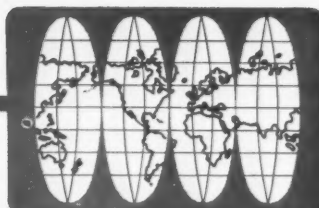
LOS ANGELES — Manufacturers of aluminum welding electrodes, All-State Welding Alloys Co., Inc., has moved into modern facilities at 4959 Firestone Blvd. here, more than doubling their former space. The new operation includes automatic welding-wire spooling machines specially designed for maximum tension control and level layer applications during spooling operations.

## Divisions Consolidated

LOS ANGELES — Brubaker Electronic, Culver City, and Nuclear Instruments of North Hollywood, two divisions of Telecomputing Corp., have been made into one division, called Electronic Systems Division, located at 13838 Saticoy St., North Hollywood.

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## Bulldog Pallet Acquires Ace Engineering Assoc.

NEWARK, CALIF. — Assets of Ace Engineering Associates, Inc., Oakland, have been purchased from the estate of Frank L. Robinson by the Bulldog Pallet Co., according to an announcement by Richard M. Duff, president of the pallet manufacturing firm.

The Oakland firm, at 1901 Grand Ave., has become a division of Bulldog and re-named Ace Engineering Co. with Duff as president and Gordon L. Dennis, vice president of the parent company, as executive vice president.

The subsidiary will continue as national distributors of pallet rollers to truckers, warehouses and docks, and of drive screw and ring shank nails, kwik-nuts and torque washers to pallet manufacturers and specialty wood fabricators.

## Tracerlab Organizes Technical Services Unit

RICHMOND, CALIF. — Tracerlab has formed a new technical services department at its Western division and reactor monitoring center. Some 55 physicists, chemists and engineers are staffing the new unit that will serve special needs of reactor manufacturers and operators, ship builders, power plants, the aircraft missile industry and similar organizations.

## New Plant for Electronic Engineering Corporation

NORTH HOLLYWOOD, CALIF. — A new plant at 5528 Vinyland Ave. was occupied recently by Industrial Electronic Engineers, Inc., manufacturers of fully automatic systems and in-line digital displays. The 10,000-sq. ft. facility includes production and engineering areas, a lab, model shop and a complete photographic studio.

## May Build Railroad To Humphreys Deposit

VERNAL, UTAH — Recent purchase of the huge Humphreys phosphate deposits by the San Francisco Chemical Co. near here has brought discussion about building a railroad to Vernal, it has been reported.

Officials of the company, jointly owned by the Stauffer Chemical Co. and the Mountain Copper Co., Ltd., of London, Eng., said the line could be an extension of either the Denver & Rio Grande from Craig, Colo., or of UP lines south from Green River, Wyo.

Stauffer spokesmen said a 35,000 kw. furnace will be built, the first of two such units, with operations tentatively scheduled to start in 1965.

The Humphreys deposit is estimated to contain 700 million tons of medium grade phosphate ore.

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WESTERN INDUSTRY/JANUARY 1960

## New Facilities For American Electronics

FULLERTON, CALIF.—American Electronics, Inc., has announced a major expansion program on property owned by the firm in Fullerton. *Phillip W. Zonne*, president, stated that they will erect 100,000 sq. ft. of office and manufacturing facilities, of which 10,000 sq. ft. is an addition to their American Laboratories Div.

Investment in the new plant and general office facilities will be approximately \$1,500,000, exclusive of equipment, and completion is scheduled for June 1960. Moving into the new plant will be the static and rotary power product lines of the Electric Machinery and Equipment Div., now located in El Monte, Calif., and the entire Electro-Mechanical Div., now located in two plants in East Los Angeles.

## PacAero Engineering Opens New Plant

CULVER CITY, CALIF.—President *V. B. Benfer* of PacAero Engineering Corp. has announced the opening of a new engineering and manufacturing plant at 11248 Playa St., which will serve as headquarters for their Technical Products Div.

Principal activities of the new division, which will be under the direction of Vice President and General Manager *Sam F. Arn*, include the design and manufacture of Spraymat ice protection systems for aircraft and missiles, plus the engineering and production of specialized training aids for military aircraft.

## Ryerson To Stock Reynolds Aluminum

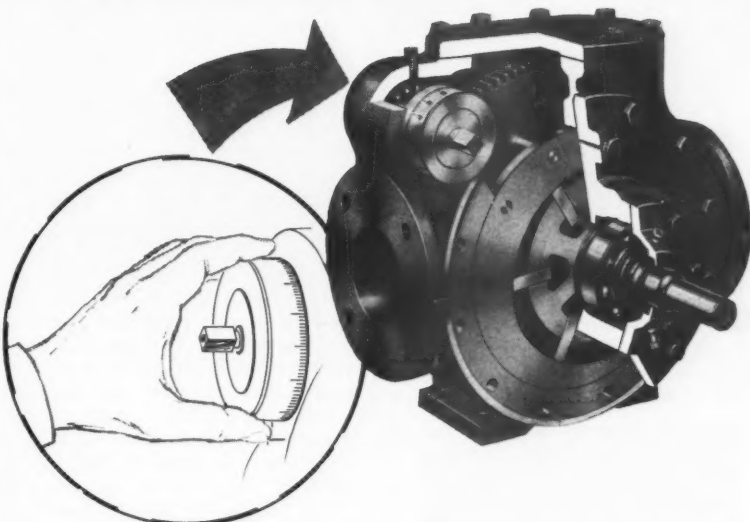
SEATTLE—Addition of Reynolds aluminum to stocks of Joseph T. Ryerson & Son, Inc., Seattle, has been announced by *Robert T. Stafford*, general manager.

Stafford stated that addition of aluminum to the Seattle stocks of carbon, alloy and stainless steel makes possible a more complete service to metal users in the area.

## Tektronix Plans Assembly Plant

HILLSBORO, ORE.—Plans for an assembly building valued at \$1,800,000 have been filed with the Washington County Planning Commission by Tektronix, Inc. The two-story 217 by 289-ft. building is to be located at 13500 S. W. Jenkins Rd.

## DIAL ANY FLOW INSTANTLY



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One Speed — Any Flow Rate! Just a turn of the dial, and the Vari-Flo delivers exactly what you need . . . as you need it. Essentially, the Vari-Flo is a highly efficient vane-type pump with a simple means for changing its displacement to vary delivery from zero to full capacity while running at constant speed. Without changing rotation, it can even reverse its flow to evacuate discharge lines after shutoff! The need for costly variable-speed drives is completely eliminated. With Vari-Flo, you change pump displacement — never the speed. Truly the most versatile of all pumps, the new Blackmer Vari-Flo offers unique solutions to countless pumping problems requiring quick or accurate control of liquid flow.

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The development of the Vari-Flo pump provides a new approach to simplified liquid proportioning. Typical applications for Blackmer proportioners cover a wide range of liquids and processes including the blending of fuel oils, asphalt, gasoline, lube oils, solvents, waxes, chemicals and many others. The low first cost of such an installation, coupled with its ease of installation and maintenance, can effect remarkable savings over the complex equipment that was once required.

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**1** SIMPLY INSERT THE "POP" RIVET INTO THE RIVET GUN. Hand operated or power guns are available depending upon your needs. "POP" Rivets can be used to fasten all materials ... metals to metals, metals to plastics, and plastics to plastics.



**2** INSERT THE RIVET IN THE PRE-DRILLED HOLE. Bring the rivet to the work ... not the work to the fastener. No lock washers or jam nuts are required. **INSTALLED COSTS ARE LESS** than any other type of fastener requiring a pre-drilled hole.



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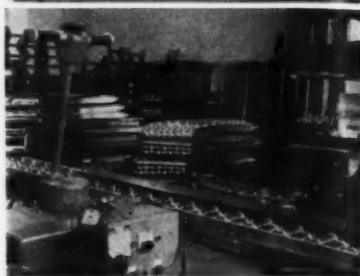
... for more details, circle No. 54

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## Rapistan Enlarges Western Facilities

SAN FRANCISCO—Rapistan of California, a subsidiary of The Rapids-Standard Co., Inc., Grand Rapids, Mich., has announced the opening on October 1 of its new facilities at 1255 Sansome in San Francisco. At the newly opened building Rapistan maintains facilities for assembly and fabrication, service, maintenance and repair, warehousing of parts, engineering, and sales. The area used for service and assembly of units has been more than doubled in size from the previous building, where only limited facilities were available for such services as warehousing and parts and assembly.

The new facilities make possible assembly of most special units from standardized parts stocked in the building. As a result the company is in a position to provide better service to its customers in the West. In addition to conveyor systems the new facility allows stocking of Raymond hydraulic and electric hand trucks.



**Top:** Rapistan of California's new building which houses sales, engineering, service, parts warehouse and assembly.

**Bottom:** Section of the warehouse where standardized interchangeable roller conveyor sections are housed. From these, special units can be constructed as per order.

## Alta Engineering Named Colorado, Utah Distributor

SALT LAKE CITY—Alta Engineering Co. of 770 S. 2nd West here and Englewood, Colo., has been named a distributor for Parker industrial tube fittings and Crown regulators, filters and lubricators made by divisions of Parker-Hannifin Corp.

Paul Locklin heads the Alta firm in Englewood, located at 2950 S. Fox St. The operation here is under management of Kenneth Sigler.

## National Equipment Moves Into New Quarters

SALT LAKE CITY—The National Equipment Co. has moved into a new \$100,000 office and warehouse building at 1020 South 6th. The 38-year old organization markets mining machinery, pumps, hoists, cranes and assorted machinery parts from branches also at Spokane, Phoenix and Albuquerque.

## Western Precipitation Corp.

LOS ANGELES—Transfer of the assets of Western Precipitation Corp. to Joy Manufacturing Co. Pittsburgh, Pa. is under consideration. WCP manufactures dust and fume control equipment. Joy is currently in production of missile launcher compressors and electrical components.

## Barber-Greene Opens San Francisco Branch

SAN FRANCISCO—A branch office and warehouse facilities have been opened here at 320 Victory Ave., South San Francisco, by the Barber-Greene Co., of Aurora, Ill. The company manufactures both continuous-mix and Batch-Omatic asphalt plants and components; asphalt pavers; permanent and portable belt conveyors; ladder and wheel ditchers; truck-loaders; railroad car unloaders and other materials handling and construction equipment. The branch office was formerly located at San Mateo, Calif.

## Building on Phoenix Plant for Fibreboard Begins

PHOENIX — An integrated shipping container plant is under construction here by Fibreboard Paper Products Corp. The 48,000-sq. ft. facility, scheduled for completion in March, will produce and ship the San Francisco firm's products for Southwest markets.

## Acoustica Acquisition

LOS ANGELES — Acoustica Associates, manufacturer of Ultrasonic equipment and systems, has announced plans to acquire Ender Monarch Corp., a Garfield, N. J., firm that produces fluorescent light fixtures for industrial and commercial use.



## New Plant Underway For Collins Machinery

MONTEREY PARK, CALIF.—A site in the new industrial development on Monterey Pass Road will be the new location for Collins Machinery Corp. of Los Angeles, manufacturer of precision cutting and threading machines.

The new plant at 955 Monterey Pass Road, planned by W. B. Semco & Associates, will be a 30,000-sq. ft. structure designed with no windows, but with interior lighting and temperature conditions to make working conditions ideal at any season.

Investment in the new project, scheduled for completion early in 1960, will be over \$300,000.

## New Facilities at San Diego For Westinghouse Divisions

SAN DIEGO—Sales and engineering headquarters for the Westinghouse Electric Corporation's apparatus, defense products and X-ray divisions now are occupying expanded new facilities at 1365 Sixth Ave., here.

The single story building has 2,000 sq. ft. of floor space. *Carlyle W. Miller* is San Diego manager for the Westinghouse apparatus division. *Noel S. Young* is defense products representative and *John H. Terhorst* is X-ray sales engineer.

## Alcoa at Wenatchee Steps Up Overseas Shipments

WENATCHEE, WASH. — Aluminum Co. of America reports that its Wenatchee works have been operating full capacity for the past several weeks, turning out 55-lb. primary aluminum pig destined for foreign markets.

According to *W. N. Farquhar*, works manager, large shipments for delivery overseas—England and Japan principally—have gone out the last two months.

## Boiler Plant Moves

BUTTE, MONT.—The Gold Top Pacific Boiler plant of San Gabriel, Calif., of which the Sullivan Valve and Engineering Co. here owns controlling interest, will be moved to Butte, providing employment for some 20 men, mechanics and others.

The new facility will manufacture boilers, water heaters and gas burners. *Walter A. Sullivan* will be president and general manager of the plant which will be located at 1415 East Second. *William Driscoll* will be plant superintendent.

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## Honeycomb Core Demand Causes Firm To Expand

COMPTON, CALIF.—Plant capacity has been expanded by some 20% at the facilities here of Tool Research and Engineering Corp.

Addition of buildings was necessitated by demand for stainless steel honeycomb core, officials said. The company has also been selected to build the launching tower for the Air Force's Pershing missile in Florida early next year.

## Ex-Cell-O, Bryant Correlate Spindle Repair Services

DOWNEY, CALIF.—The Ex-Cell-O Corp. plant here is one of the locations for a correlated spindle repair service arrangement made by Ex-Cell-O and Bryant Chucking Grinder Co., a subsidiary. The Downey plant will repair all Ex-Cell-O and all Bryant spindles except those with high frequency in-built motors.

## Osborne Electronic Acquires Rights of Radio Concern

PORTLAND—Rights and certain assets of D. W. Thomas Engineering Co., San Pedro, Calif., have been acquired by Osborne Electronic Sales Corp. of Portland and Hawthorne, Calif.

The purchase will permit Osborne to produce and sell transistorized two-way radio communications equipment, in addition to its transformers, potentiometers and other products.

## Southwestern Industries Adds to Lab Facilities

LOS ANGELES — Southwestern Industries, Inc., 5880 Centinela Ave., will expand its laboratory facilities for evaluation and development of rotating machinery and fuel systems. The firm is engaged in development of pumps and hydraulic, pneumatic and mechanical equipment for advanced applications.

## Sealy Mattress Plans Move to Berkeley Site

BERKELEY—New location for the Sealy Mattress Co. of Northern California, now in Oakland, will be 930 Dwight Way, where Sealy has purchased the former Kawneer plant from Rheem Mfg. Co.

The mattress firm plans a remodeling of the 65,000-sq. ft. plant, which had been vacant for about a year.

## New Regional Set-Up For Fairbanks, Morse

SAN FRANCISCO — As the first step in a sales regionalization program, Fairbanks, Morse & Co., Chicago, has established a Pacific Coast sales region with headquarters at 630 Third St. here. The new area setup is headed by Roger R. Murray, now vice president in charge of the region.



The region includes all or part of 11 Western states and covers district sales offices in Los Angeles, Salt Lake City, Portland, Seattle and Phoenix.

Murray, who has been with the firm for 43 years, has worked in Beloit, Sacramento and Salt Lake City for Fairbanks Morse. He became San Francisco branch manager in 1933.

## Swedlow Acquisition

LOS ANGELES — Swedlow, Inc., of Youngstown, O., and Los Angeles has acquired a financial interest in the recently formed TE Company of Santa Barbara, Calif., manufacturer of electronics, optical and mechanical units and systems. Swedlow will continue to produce its present specialized materials for missile, aircraft and industrial fields, including honeycomb core, plastic glazing for aircraft windows, laminates, and related products.

## Topp Industries Merger

LOS ANGELES — A merger is under consideration for United Industrial Corp. with Topp Industries of Los Angeles. United Industrial manufactures material handling and marine equipment, hoists, pumps, fluid power generators and other heavy machinery. Topp is a manufacturer of electronic and electro-mechanical devices and systems, with several subsidiaries.

## Bruner is Hagan Subsidiary

LOS ANGELES — Bruner Corp., manufacturer of water treating equipment with plants here and in Milwaukee, Wis., is now a wholly-owned subsidiary of Hagan Chemicals & Controls, Inc., Pittsburgh. No changes in personnel or general policy are anticipated.

## Contract News in the West

LOS ANGELES—Republic Aviation has awarded *Lear, Inc.* a \$1,400,000 follow-on order for variable air inlet control systems and trailing edge flap systems for Republic's F-105B Thunderchief.

The U.S. Army Ordnance District at Los Angeles announced contracts totaling over one million dollars to the following contractors: *California Institute of Technology*, Pasadena, \$825,000 research and development contract for wind tunnel testing; *Douglas Aircraft Co.*, Santa Monica, \$225,625 for Nike missile repair parts. *AiResearch Mfg. Co.*, \$129,837 for Nike Hercules missile repair parts. *Permanent Filter Corp.*, \$46,556 for Nike missile repair parts and *Townsend Engineered Products*, Santa Ana, \$29,989 research and development contract for fire suppression kits.

From the San Francisco Ordnance District for December, contracts for various defense agencies were awarded totaling \$757,278. These include: *Stanford Research Institute*, Menlo Park, a \$250,000 extension award; *Pacific Tire and Rubber Co.*, Oakland, \$154,289 for mud and snow truck tires; *Food Machinery and Chemical Corp.*, San Jose, modified and extended contracts totaling \$154,129; *Ball Bearing Co.*, San Carlos, \$59,021 for roller bearings.

Other Bay Area firms receiving contracts include: *Ampex Corp.*, *Philco Corp.*, *Hewlett-Packard Co.* and *Kaiser Aircraft & Electronics*.

Among other contracts reported to WESTERN INDUSTRY recently were orders to:

*Iron Fireman Mfg. Co.*, electronics division, about \$1,000,000 for drone gyroscopes from Radioplane, a division of Northrop Corp.

*Packard Bell Electronics*, \$250,000 for design, development and production of a multichannel, ground-air-ground radio receiver for Air Force.

*W. G. Clark Construction Co.*, Seattle, \$406,000 by AEC for construction of a building addition and alterations to the 234-5 building for an inspection facility at Hanford Works.

*Frank H. Lohse*, Richland, Wash., \$149,950 contract for construction of chemical processing facilities for AEC, Hanford Works.

*Teller Construction Co.* and *Arington Construction Co.*, Idaho Falls, for total of \$166,719 for construction of the National Reactor Testing Station, Idaho. *James Reed*, Salt Lake City contractor, awarded contract for \$52,300 to construct Flood Control

Project No. 3 at the testing station.

The *Underwood Testman Co.* and the *H. E. Scott Construction Co.* of Albuquerque were low bidders for work on the Sandia Labs and have received contracts from AEC.

*Drayer-Hanson* was awarded contract by Marquardt Corp. for construction of mechanical refrigeration units for checkout stands in one of the missile programs.

Contract amounting to nearly \$400,000 has been awarded to *Telemeter Magnetics, Inc.*, Los Angeles, by Jet Propulsion Laboratory of the California Institute of Technology. The contract covers development and manufacture of airborne digital programmers and ground-based checkout systems for Project Vega.

A contract for design of a major U.S. space vehicle launch complex at the Atlantic Missile Range, Cape Canaveral, Fla., has been awarded to *Convair (Astronautics) Division* of General Dynamics Corp. by the Ballistic Missile Div., Air Research and Development Command, Inglewood.

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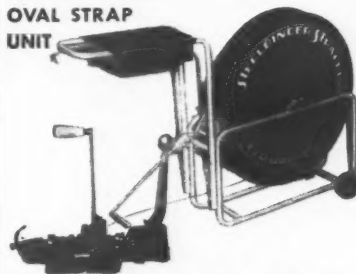
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## NEW PRODUCTS

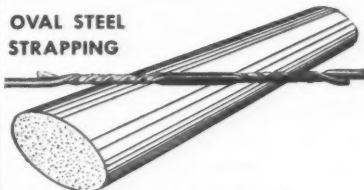
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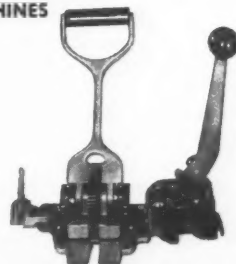
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### STRAP AND WIRE CUTTER



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## westerners at work

■ **Ralph Bradley** has been appointed manager of a newly created dealer division of Pascoe Steel Corp. by **Robert W. Zoellner**, marketing vice president of the Pomona, Calif., steel building manufacturing company. Bradley has been connected with Pascoe Steel's dealer activity for almost four years.

■ **Standish H. Harrison** has been named Pacific Coast region marketing manager for the Westinghouse Electric Corp.'s apparatus division. Mr. Harrison's advancement from regional industrial sales manager highlighted a series of organizational changes adapting apparatus division operations to changed marketing conditions.

■ **J. L. Humphrey**, formerly manager of industrial fastener sales, Bethlehem Steel Co., Pacific Coast division, has been appointed manager of sales in the Seattle district office. **John G. White** has been named assistant general manager.

■ **C. Lee Emerson** has been elected vice president in charge of sales by the board of directors of Kaiser Steel Corp. Emerson joined the Kaiser organization in 1942 as materials engineer at the Richmond, California shipyards. In 1945 he transferred to the sales department at Kaiser Steel.

■ **P. W. Hookey**, formerly welding engineer for Douglas Aircraft at Long Beach, has been selected by N.T.W. Corp., Los Angeles, to serve as materials and welding engineer. While



**C. Lee Emerson**  
Kaiser Steel



**J. L. Humphrey**  
Bethlehem



**R. C. Boehm**  
Tuck-Aire



**S. H. Harrison**  
Westinghouse



**Eugene Wilmoth**  
Oakite



**R. H. Garretson**  
CEC



**P. W. Hookey**  
N.T.W. Corp.



**Ralph Bradley**  
Pascoe Steel

associated with Douglas, Hookey was assigned to all ground handling with support equipment for the Thor missile project.

■ **Robert C. Boehm** has been named vice president of Tuck-Aire Furnace Co., San Francisco. A registered mechanical engineer, Boehm joined the firm in 1953 as a salesman. Prior to joining Tuck-Aire he was associated with General Controls and the Fulton Sylphon Co.

■ **Robert H. Garretson**, formerly with IBM, has been appointed group vice president, data processing divisions of the Consolidated Electrodynamics Corp. at Pasadena. In the newly created post, Garretson will be responsible for the operations of the company's transducer, electro mechanical instrument, datatape and datalab divisions. He will also serve as a member of the board of directors of CEC upon completion of the pending merger with Bell & Howell Co.

■ **Eugene Wilmoth** has been appointed to the Los Angeles technical service staff of Oakite Products, Inc., manufacturers of specialized chemical compounds for industrial cleaning and sanitation. A graduate of Woodbury College, Wilmoth completed an intensive training program at the company's New York labs before undertaking his new assignment.

■ **Harry K. Shackelford** has been appointed industrial-automotive sales representative by the Black & Decker

Mfg. Co. of Towson, Md. Shackelford has been assigned to the electric tool company's San Francisco sales district and will headquarter at Fresno, Calif.

■ **Beverly D. Kumpfer** has been named general manager of the Salt Lake City plant of Litton Industries electron tube division which headquarters in San Carlos, Calif.

■ **Louis F. Lafferty** has been named manager of Aluminum Co. of America's branch sales office at Portland, succeeding the late **Eugene P. Burton**. Lafferty moves to the West from Lafayette, Ind., where he has been an ALCOA resident sales manager.

■ **John W. Blewett** has been appointed industrial relations superintendent of the St. Helens insulating board products plant of Kaiser Gypsum, Inc. Blewett replaces **Richard Wilborn** who is being transferred to Kaiser Gypsum's new plant under construction near Albuquerque, N. M.

■ **Harry W. Vinson**, on the staff of Empire Steel Corp., Denver, for the past four years, has been promoted to sales manager. He was formerly with M. L. Foss, Inc., in the pricing and sales department.

■ **Jerry Barfoot**, managing director of Engineering & Marketing Assoc., Inc., Portland, has appointed **Irwin C. Shotwell** to the 15-man EMA technical advisory board. Shotwell is a departmental industrial engineer at ALCOA's Vancouver plant.



■ **Frank H. Manley, Jr.** has been named a Western area sales-service representative for Falls Engineering and Machine Co. of Cuyahoga Falls, O., manufacturer of special industrial equipment, V-belt molds and other products. Manley's territory includes nine Western states.

■ **Jack W. Forbes** has been selected by Universal-Cyclops Steel Corp., Bridgeville, Pa., as Western representative for sale of refractory and reactive metals. He was formerly with Cleveland Wire Works of General Electric Co., and with the Molybdenum Corp.

■ **Glenn Carnine** has been transferred from the Vancouver, Wash., plant of Becco Chemical Division, Food Machinery and Chemical Corp. Previously quality control chemist and chief chemist in Vancouver, he is now chief control chemist at the Buffalo, N. Y. plant.

■ **Robert E. Walter** has been selected as sales engineer for The Barden Corp., serving San Francisco and Northern California, Oregon and Washington areas. Walter has over 10 years' experience in the precision ball bearing field, previously representing Barden through a San Francisco distribution firm.

■ **Jack Baxby** is now project manager, R & D contracts, for McCormick Selph Associates, Hollister, Calif. His duties include preliminary design functions in specialized explosive devices.

■ **Karl A. Gardner** has been made vice president, engineering, for Yuba Consolidated Industries, Inc., with headquarters at the corporation's engineering and marketing development center in Palo Alto. Gardner was formerly chief engineer for Griscom-Russell Co., Massillon, O.

■ **J. R. Fraser** has been promoted by Union Oil Co. of California to be manager of the natural gas and gasoline department, with headquarters in Los Angeles. He succeeded *K. C. Vaughn*, now manager of operations for Union's Gulf Division in Houston.

■ **Lee J. Strobl** has been promoted to the post of plant manager of the Los Angeles Soap Co., succeeding *George W. Busby, Jr.* An employee of the firm since 1935, Strobl has been plant superintendent for more than six years.

■ **Heinz Hanau** has been appointed director of engineering and research for Industrial Tectronics, Inc., Western Division, in Compton, Calif. For the last 9 years Hanau has been with the New Departure Division of General Motors, recently as supervisor of aircraft projects.

■ **Dr. Henry Marchman** has been named by Rheem Semiconductor Corp., Mountain View, Calif., as vice president and manager of the engineering department. Before joining this new subsidiary of Rheem Mfg. Co., Dr. Marchman was with Standard Oil Co. in its chemicals development division, with Velsicol Chemical Corp., and with Hercules Powder Co.

■ **Kenneth Goodmann**, formerly with Helipot Div., Beckman Instruments, Inc., has been named chief engineer of Engineered Electronics Co. of Santa Ana, Calif. Goodman previously has been associated with Aerovox Corp. and AiResearch Mfg. Co.

■ **Julian M. White, Jr.**, has been named general manager of the Chelatchie, Wash., plywood and lumber operation of International Paper Company's Long-Bell Division. Previously general manager at Vaughn, Ore., White is succeeded in that post by *Henry G. Reents*.

■ **H. A. (Jim) Curwen** has been chosen for a new position, technical director, by Earle M. Jorgensen Co., steel and aluminum distributing firm. Increasing complexity of metallurgical problems, particularly in the aircraft-missile field, made the position necessary, the firm announced. Curwen has been with Jorgensen since 1946, and previously has been with Timken Roller Bearing and with Copperweld Steel Co.

■ **Donald Wright** has joined Standard Steel Corp., Los Angeles, as director of public relations and publicity. He succeeds *Edward J. Meier* who resigned the post to open his own public relations firm.

■ **Carl Baumhofer** has been appointed works manager for Recold Corp., Los Angeles air conditioning and refrigeration firm. Previously associated with Servel for 12 years, he has recently been general superintendent for a Los Angeles appliance manufacturer.

■ **James E. McGoldrick**, *Thomas M. Tinkle* and *William R. Klauer*, all staff engineers, have joined Neely Enterprises, electronic manufacturers' representative firm. McGoldrick will be assigned to North Hollywood, Tinkle to the firm's Albuquerque office and Klauer to the Sacramento branch.

■ **Robert Card** has been named head of the Boise sales office of Woodbury & Co., Portland steel and industrial supplies distributors. Formerly with Gate City Steel of Boise, Card will represent Woodbury throughout western Idaho.

■ **R. S. Anderson** has been selected by Leach Corp. to fill a newly-created position, manager of the Special Products Division. An authority on computer development and systems analysis, Anderson was previously manager of operations.

■ **Evan Hall** of Calaveras Cement Co., has been named assistant plant manager at the firm's San Andreas, Calif., plant, succeeding the late *Tom Love*. Hall's position as mill superintendent will be filled by *David Cosgrave*.

■ **Don Kohler** has been named by California Chassis Co., Lynwood, Calif., as Pacific Northwest sales representative. Headquartered in Seattle at 11532 Fourth Ave. N. E., he will cover Idaho, Oregon and Washington.

■ **Keith Smith** has been appointed applications engineer on the sales staff of Electronic Engineering Co. of Calif. Formerly on the firm's engineering staff, Smith joined the company in 1955, while still a USC student.

■ **E. W. Casagrande**, manager of the Shell Chemical Corp. Martinez, Calif., has been transferred to Dominguez, Calif., where he will be plant manager. *H. J. Thomas* was appointed his successor. Casagrande joined Shell in 1934, while Thomas became associated with the firm in 1936. Recently he has been assistant superintendent of the Martinez plant.

*Walter Hansen* has succeeded *William H. M. Porter* as manager of the Seattle branch of Enterprise Engine & Machinery Co. Porter has been a representative of the firm for over 25 years and will now be an engineering and sales consultant. Hansen has been a service engineer for Enterprise for 20 years.

[illegible]

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## STANDARD ENGINEER'S REPORT



# Close tolerances...yet Chevron Cutting Oil increases cutting speeds and tool life

When tapping speeds increase, inferior thread quality and faster chaser wear are the usual results...but not always!

**Lakewood Pipe Coupling and Service**, Bellflower, Calif., found they could increase thread tapping speeds with Chevron Cutting Oil 210 TA and still meet API Class 3 tolerances.

"We not only cut smoother threads at higher speeds," reports President Frank Tybus, "but chasers last longer, too!"

We experimented a lot before we settled on Chevron Cutting Oil. That was five years ago...we're still using it. We've tried other products from time to time, but we've yet to find anything else that does as good a job for us on this thread tapping operation."

**Equipment note:** This Stamets tapping machine (above) cuts threads in mild steel 8-inch pipe couplings in less than 3 minutes using Chevron Cutting Oil. Machine uses Landis circular chasers.

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